Edited by Timothy Shopen

Language Typology

and Syntactic Description

Volume III:
Grammatical Categories and the Lexicon

SECOND EDITION

CAMBRIDGE

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Language Typology and Syntactic Description

Second edition

Volume III: Grammatical Categories and the Lexicon

This unique three-volume survey brings together a team of leading scholars to explore the syntactic and morphological structures of the world's languages. Clearly organized and broad-ranging, it covers topics such as parts of speech, passives, complementation, relative clauses, adverbial clauses, inflectional morphology, tense, aspect mood, and deixis. The contributors look at the major ways that these notions are realized, and provide informative sketches of them at work in a range of languages. Each volume is accessibly written and clearly explains each new concept introduced. Although the volumes can be read independently, together they provide an indispensable reference work for all linguists and field workers interested in cross-linguistic generalizations. Most of the chapters in the second edition are substantially revised or completely new – some on topics not covered by the first edition. Volume III covers typological distinctions in word formation; lexical typologies; inflectional morphology; gender and noun classes; aspect, tense, mood; and lexical nominalization.

Timothy Shopen (1936–2005) was Senior Lecturer in Linguistics at the Australian National University. He had over forty years' experience of teaching and researching a variety of the world's languages, and also held posts at Indiana University and the Center for Applied Linguistics in Arlington, Virginia. In addition to *Language Typology*, he was editor of *Standards and Dialects in English* (1980), *Standards and Variables in English* (1981), *Languages and their Speakers* (1987), and *Languages and their Status* (1987).

Language Typology and Syntactic Description

Second edition
Volume III: Grammatical Categories and the Lexicon

Edited by

Timothy Shopen[†]

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Acknowledgements

Language typology studies what the languages of the world are like. When people ask 'What is linguistics?', from my point of view one of the best answers is 'the study of what the languages of the world are like'. I an honoured to have been joined by some excellent linguists in the achievement of this second edition of *Language Typology and Syntactic Description* for Cambridge University Press.

I am especially grateful to Matthew Dryer for coming in as co-editor when my health began to fail. Many thanks also to Lea Brown, for the invaluable help she gave Matthew in preparing the manuscript.

The Australian National University has always been generous in its support of my work. Except for the two and a half years I lived in Cairns, 2001 to 2003, it has been my base since I moved to Australia in 1975. I recognize the support I received from James Cook University during my time in Cairns.

I came up with the idea used to organize the first edition at a conference on field work questionaires held at the Center for Applied Linguistics, Washington, DC. I said the best way to prepare for field work is to gain a good idea of what to look for. People thought this was right so I was asked to do the organizing. There have been surveys in the past but I believe none with this scope. The first edition has served as a reference manual and a textbook around the world and I have no doubt the second edition will as well. I have been pleased by the number of good linguists who have told me they have referred to our survey while doing field work valuable to us all.

Interest in the question of what the languages of the world are like is a longstanding one, but in the modern era Joseph Greenberg is an outstanding scholar who did important early work himself and was a model for others to do the same.

In an obituary for Joseph Greenberg by Steve Miller the distinction is made between taxonomists who are lumpers and splitters. Steve Miller says:

It is fitting that it was Darwin who first thought of the distinction between lumpers and splitters; the OED gives him the first citation of the words as applied to taxonomists. Lumpers gloss over or explain differences in pursuit of hidden unities; splitters do the opposite, stressing diversity.

Joseph Greenberg was a linguistic lumper and his dream of recreating the ur-language of humanity must stand as one of the greatest lumping dreams of all time. He dreamed of deep unity, and he spent an extremely long career pursuing evidence for it. He was still publishing highly technical evidence when he died, at age 85.

It is sad that he never published a manifesto, but he was a scientist and his inductive sensibility was not prone to making sweeping statements unsupported by minute attention to evidence. The nearest he came was in his conclusion to the controversial 1987 *Language in the Americas*, a book that grouped all languages in the western hemisphere into three families: 'The ultimate goal is a comprehensive classification of what is very likely a single language family. The implications of such a classification for the origin and history of our species would, of course, be very great.' Very great, as in, language was invented once and we might even have some ideas about what that language sounded like.

I was with Joseph Greenberg at Stanford University when he was doing his work, scouring through the part of the library that had grammars, making his counts: if you find construction x in a language you will always find, or you will be likely to find, construction y. This kind of commonality intrigued him. More from Steve Miller:

The splitters of linguistics have this problem: they're just not as interesting as the lumpers. The splitters' story is that the origins of language are irretrievable, so we should value every language for its expressive ability, but not for its place in the grand drama of linguistic diffusion. Greenberg, and the Nostraticists, and others who have tried to talk about language as a unity, dreamed something that may never be provable, but will continue to inspire us as a story that unites the human race as part of an ongoing story.

We give aid to both the lumpers and the splitters but I believe most of all to the lumpers. Languages differ from each other but only to a certain degree. Humankind is united in its use of language. This is an important message for us all as we go about our pursuits and combine with others to deal with the world.

TIMOTHY SHOPEN

Canberra, Australia
September 2004

Abbreviations and symbols

The following are abbreviations for grammatical terms used frequently in the glosses for examples. Other abbreviations are explained as they are presented.

A	agent (in chapter 2)
A	subject of a transitive verb
A (followed by	absolutive agreement marker (in chapter 3)
ABnumeral, e.g. A3)	abessive
ABL	ablative
ABL (PRIOR)	ablative case in agreement with past tense of verb (in chapter 3)
ABS	absolutive
ACC	accusative
ACT	actual mood
ADJ	adjectivizer
ADL	adlative
AFF	affix
AGT	agentive
ALL	allative
ANT	anterior
AOR	aorist
APPL	applicative
APR	apprehensive
ART	article
ASP	aspect
AUG	augmentative
AUGM	augmented
AUX	auxiliary
CAUS	causative
CISLOC	cislocative
CL	classifier

CL	class (in chapter 7)
CND	conditional
CNTMPL	contemplative
COM	comitative case
COMP	complementizer
COMP	compounding (in chapter 1)
COMPL	completive aspect
COND	conditional
CONJ	conjunct mode (in chapter 3)
CONT	continuous
COP	copula
CSN	comparison
CV	epenthetic syllable
D.O.	direct object
DAT	dative
DECL	declarative
DEF	definite
DEM	demonstrative
DENOM	denominal
DER	derivational
DEST	destinative case
DET	determinator (in Cree verb forms, in chapter 3)
DET	determiner
DIM	diminutive
DIR	direct transitive relation
DO	direct object
DTR	detransitivizer
DU	dual
DUR	durative
E	epenthetic (in chapter 1)
E	experiencer (in chapter 2)
E (followed by	ergative agreement marker (in chapter 3)
ELnumeral, e.g. E3)	elative
EMPH	emphatic
EPEN	epenthetic vowel
ERG	ergative
EXCL	exclusive
EZ	ezafe, izafet
F	feminine
F	figure (in chapter 2)
FAM	familiar

FEM	feminine
FIN	finite form
FUT	future
G	ground
GEN	generic (in chapter 1)
GEN	genitive
GENIT	genitive
GER	gerund
HAB	habitual
HON	honorific
HORT	hortative
HUM	human
IF	imperfect
IFV	imperfective
IMP	impersonal
IMP	imperative (in chapter 7)
IMPF	imperfect / imperfective
IMPV	imperative
INAN	inanimate
INCL	inclusive
IND	indicative
INDEF	indefinite
INDIC	indicative
INESS	inessive
INF	infinitive
INFL	inflection
INFR	inferential
INFV	infinitive
INS	instrumental
INSTR	instructive (in chapter 1)
INSTR	instrumental
INSTRC	instructive (in chapter 7)
INSTRM	instrumental
INTENS	intensifier
INV	inverse transitive relation
IO	indirect object marker
IPFV	imperfective
IPV	imperative
IRR	irrealis
ITER	iterative
ITT	iterative
LAT	lative

LINK	linker
LOC	locative
LOG	logophoric pronoun
M	masculine
M/A	mode–aspect
MASC	masculine
MIN	minimal
MOM	momentaneous aspect
MSC	masculine
NCL	noun class
NEG	negative, negation
NEUT	neuter
NF	non-feminine
NOM	nominative
NOMIN	nominalization
NONHON	nonhonorific
NONOBJ	non-object
NP	noun phrase
NPT	nonpast
NSG	nonsingular (neutralizing a dual vs plural contrast)
NTL	neutral
NTR	neuter
NUM	numeral
NZR	nominalizer
O	direct object
OBJ	object
OBJ	object marker (in chapter 3)
OBJ	objective [argument] (in chapter 5)
OBL	oblique
OPT	optative
P	object of transitive verb
P	patient (in chapter 2)
P	person (in chapter 1)
PART	particle
PASS	passive
PAT	patient
PAUC	paucal
PCL	particle
PCP	participle
PEJ	pejorative
PERF	perfect/perfective
PERF	perfect tense (in chapter 3)

PF	perfect
PFV	perfective
PGR	progressive
PI	past imperfective
PL	plural
PNT	potential
POSS	possessive
POSSPRO	possessive pronoun
POT	potential
PP	past participle
PP	past perfective (in chapter 1)
PRES	present
PROG	progressive
PROGR	progressive
PRP	prepositional case
PRS	present
PST	past, preterite
PT	past
PURP	purposive converb, supine
Q	question marker
R.PAST	remote past
RECIP	reciprocal
REFL	reflexive
REL	relative, relativizer
REM	remote
RESTR	restrictive focus ('only'; 'just')
RLS	realis
S	subject of an intransitive verb
S.SET	specific setting
SBJ	subjunctive
SEQ	sequential
SG	singular
SIM	similarity case ('like') (in chapter 3)
SIM	simultaneous (in chapter 5)
SS	same subject
STV	stative
SUB	subjunctive
SUBJ	subject
SUBORD	subordinate
TEL	telic
TNS	tense
TOP	topic

TR	translative (in chapter 1)
TRANSLOC	translocative (locative prefix)
V	verb (root)
VBZR	verbalizer
VCL	verbal classifier
VN	verbal noun
VOL	volitional
WP	witnessed past
1	first person
2	second person
3	third person
4	fourth (obviative) person
1SG	first person singular (etc.)
3PL	third person plural (etc.)
.	separates elements of interlinear that correspond to a single morpheme in the original
φ	zero marking
-	affix boundary
=	clitic boundary
(M), (F), ETC.	gender (masculine, feminine, etc.) of noun in chapter 3. (Gender as agreement category is not in parentheses.)
Σ	first element of bipartite verb stem
Σ2	stem alternate
	syllable (annotates left bracket in prosodic transcriptions)
[ ]	glosses in square brackets are zero-marked (in chapter 3)

Roman numerals refer to gender classes.

1   Typological distinctions in word-formation

Alexandra Y. Aikhenvald

0   Introduction

This chapter deals with patterns of word-formation, their classification and parameters of cross-linguistic variation. Grammatical words (section 1) in most languages have an internal structure; the typological parameters which account for their cross-linguistic variation are discussed in section 2. Word-formation processes correlate with syntax in different ways depending on language type. One such word-formation process – known as 'the most nearly syntactic of all' (Mithun (1984)) – is noun incorporation, discussed in section 3.

The structure of words in a language can be more or less iconically motivated (see section 4). Word-formation, traditionally, falls into compounding and derivation. A compound consists of morphemes which could be free (see section 5), while derivation involves the use of different classes of bound morphemes and of morphological processes to form words (see section 6). Word-formation processes vary in terms of their productivity – see section 7. Word-formation processes are prone to distinct patterns of grammaticalization and lexicalization – see section 8. A brief summary is given in section 9, and in section 10 I provide suggestions for field workers describing word-formation in previously undocumented or poorly documented languages.

1   The word

Word-formation accounts for the structured organization of the lexicon. The lexicon is usually conceived of as a list of the form–meaning correspondences conventionalized by speakers, but which are largely arbitrary. However, this list may be structurally organized. The principal function of word-formation is the enrichment of the lexicon by forming new words; for instance, *redden* and *reddish* in English are regular derivations based on *red*.

What is a word? 'Word' has, for a long time, been recognized as a universal unit by scholars of varied persuasions. The concept of the word is, however, at least twofold. Many languages make a distinction between *phonological* and *grammatical* word (though the majority of grammars do not pay enough

attention to this distinction: see Dixon (1977, 1988); Foley (1991); S. R. Anderson (1985a)).

A *phonological* word can be defined as a prosodic unit not smaller than a syllable. Cross-linguistic criteria used to distinguish the phonological word include: (i) stress and other prosodic characteristics; (ii) phonotactics, and phonological rules which apply either word-internally or across word boundaries. See further discussion in Dixon and Aikhenvald (2002).

A *grammatical* word consists of a number of grammatical elements which (i) always occur together, rather than scattered through the clause (the criterion of cohesiveness); (ii) occur in fixed order; and (iii) have a conventionalized coherence and meaning (Dixon and Aikhenvald (2002); see also Dixon (1977:88, 1988:21–31); Matthews (1991)). Criterion (iii) relates to both the number of morphemes per word and the expression of grammatical categories which are obligatory for a grammatical word to be well-formed in a given language. In most non-isolating languages (see section 2), a grammatical word must include at least one inflectional morpheme. For instance, in Yidiny it can have only one (Dixon (1977)). In North Arawak languages of South America a grammatical word must contain at least one root morpheme and not more than one prefix. The presence of inflectional morphemes is not obligatory in grammatical words in Kaingang (Gê), which shows a general tendency toward isolating typology (Wiesemann (1972)).

Grammatical and phonological words often, but not always, coincide (e.g. Lehiste (1964); Dixon and Aikhenvald (2002)). Thus, many languages have clitics which constitute grammatical words on their own but must be attached to another grammatical word within one phonological word and thus cannot form a phonological word on their own, e.g. *-n't* as in English *mustn't*.

Further distinctions within the concept of word include word as an orthographic unit (a useful tool for counting the number of words while composing a telegram; however, it is applicable only to languages with an institutionalized writing system) and word as a lexical unit – that is, a unit which can be treated as one entry in a dictionary (see Mugdan (1994:2551)). Lexical units, whose form–meaning association is hardly predictable on the basis of the meaning of their components, are not limited to a list of words only. Often, a combination of words – a phrase, or even a sentence – can be *idiomatic*, or non-compositional. In English, expressions like *she spilt the beans* or *willy-nilly* ought to be included in lexical listings, based on the arbitrariness of lexical information.

In this chapter, we will limit ourselves only to words as *grammatical* units, concentrating on discovering the principles of the internal structure of words and their cross-linguistic variability, rather than on the arbitrariness of the form–meaning correlations. For this reason idiomatic combinations of words will not be discussed any further. Throughout the chapter, when we say 'word', we are

referring to 'grammatical word' (see Dixon and Aikhenvald (2002), for further discussion).

2 Morphological typology and word-formation

The traditional parameters used for morphological typology of languages starting from the nineteenth century were largely based on the differences in their internal word structure. These parameters are of two kinds. The first one is based on the transparency of morphological boundaries between the morphemes within a grammatical word, and the second one relates to the degree of internal complexity of words (see E. Sapir (1921)).

2.1 Transparency of word-internal boundaries

Based on this parameter, three types of language are recognized: *isolating*, *agglutinating*, and *fusional*.

An *isolating language* typically has a one-to-one correspondence between a morpheme and a word; that is, in such a language every morpheme is an independent word. An example of an almost perfectly isolating language is Vietnamese, as illustrated in (1) (Thompson (1987:207)).

(1)   Chị ẩy   quên
        s/he ANAPHORIC forget
        'She (or he) forgets', or 'She (or he) has forgotten', or
        'She (or he) will forget'

Every word in this sentence is invariable. There is no morphological variation for tense, or for grammatical function. Where English grammar would require a reference to time in the verb in every sentence, in speaking Vietnamese one is not required to have this. The time reference is understood from the context; so (1) could also be translated as 'She (or he) has forgotten' or as 'She (or he) will forget'. If time reference is important, a time word or an aspect marker – also a separate word – can be inserted. In (2), an 'anterior' aspect marker is used in the same sentence as (1) to indicate that the action of 'forgetting' started before the time of the utterance.

(2)   Chị ẩy   đã   quên
        s/he ANAPHORIC ANTERIOR forget
        'She (or he) forgot' or 'She (or he) has forgotten'

It is in general true that every word in Vietnamese consists of just one morpheme; however, the existence of productive compounding and its lexicalization results in the creation of words of more complicated structure, e.g.

hôm nay (day now) 'today', *hôm kia* (day that) 'day before yesterday', *hôm kía* (day that; more remote than *kia*) 'two days before yesterday'.

In an *agglutinating language*, a word may consist of several morphemes but the boundaries between them are clearcut. There is typically a one-to-one correspondence between a morpheme and its meaning, and a morpheme has an invariant shape which makes it easy to identify. Hungarian and Turkish are classic examples. A noun is easily segmentable into a lexical stem, a number affix and a case affix. An extract from the Hungarian noun declension paradigm for *ember* 'man' is illustrated below.

	Singular	Plural
Nominative	*ember*	*ember-ek*
Accusative	*ember-et*	*ember-ek-et*
Dative	*ember-nek*	*ember-ek-nek*
Locative	*ember-ben*	*ember-ek-ben*

In *fusional* – sometimes misleadingly called (in)flectional – *languages* there is no clear boundary between morphemes, and thus semantically distinct features are usually merged in a single bound form or in closely united bound forms. Extracts from Russian nominal paradigms for *dom* 'house' and *koška* 'cat' below illustrate this point.

	Declension 1		Declension 2	
	Singular	Plural	Singular	Plural
Nominative	*dom*	*dom-a*	*košk-a*	*košk-i*
Accusative	*dom*	*dom-a*	*košk-u*	*košek*
Dative	*dom-u*	*dom-am*	*košk-e*	*košk-am*
Instrumental	*dom-om*	*dom-ami*	*košk-oj*	*košk-ami*

An affix like *-ami* cannot be segmented into a marker for number and a marker for case; and in a word like *košek* ('cats' accusative plural) the stem itself is fused with case and number. Along similar lines, in Latin the final *-a* of *femina* 'woman' expresses the meanings: nominative case, singular number and feminine gender (as well as first declension).

The term *(in)flectional*, sometimes used in place of fusional, is misleading: we will see in section 11 that both fusional and agglutinating languages, as opposed to isolating languages, can have inflectional morphology.

Fusion and agglutination are best treated as quantitative notions. Even the 'classic' agglutinating languages such as Turkish or Hungarian may be problematic with respect to the treatment of boundaries and the existence of variants of morphemes (allomorphs). These languages are known for vowel harmony across morphemic boundaries, e.g. Hungarian *ember-ek-ben* (man-PL-LOC) 'in men', but *ásztal-ok-ban* (table-PL-LOC) 'in tables'. In addition, Hungarian has a

certain amount of stem alternation in the formation of plurals (e.g. *szó* 'word', pl. *száv-a-k)* (see Hagège ([1990](#)) on the tendency of an agglutinating morphology to develop into a fusional, or partly fusional, type). Various phonological processes apply across morpheme boundaries, and, as a consequence, the morpheme boundaries may become blurred, which yields the creation of fusional morphology (see section 6).[1]

2.2   *Internal complexity of grammatical words*

The second typological parameter has to do with the number of morphemes per word. This typological dimension is largely complementary to that described in section 2.1.

Analytic languages tend to have a one-to-one correspondence between a word and a morpheme; they have few if any bound morphemes. Vietnamese (1–2 above) or Mandarin Chinese are good examples of analytic languages.

In contrast, in *synthetic* languages a word consists of several morphemes, and there are numerous bound morphemes. Hungarian or Russian are representative of synthetic languages.

Polysynthetic languages (also sometimes called 'incorporating': see section 3, on the reasons for distinguishing these terms) are characterized by extreme internal complexity of grammatical words. Here, the bound morphemes often express semantic content reserved for lexemes in languages of other types. Polysynthesis basically refers to the possibility of combining large numbers of morphemes (lexical and grammatical) within one word, as in the following example from West Greenlandic (Fortescue ([1994](#):2602)):

(3)   anigu-ga-ssa-a-junna-a-ngajal-luinnar-simassa-galuar-put
       avoid-PASS-PART-FUT-be-no.longer-almost-really-must-however-
       3PL.INDIC
       'They must really almost have become unavoidable but . . .'

Interest in polysynthesis has grown considerably since the 1990s, due to an increasing amount of new data from different parts of the world (Foley ([1986](#), [1991](#)); De Reuse ([1994](#)); Fortescue ([1994](#)); among others). The following traits tend to cluster in polysynthetic languages, although none of them is defining by itself (Fortescue ([1994](#):2601)):

(I)   noun stem incorporation within the verbal complex, and incorporation of adjectival stems within nouns (see section 3);

---

[1] E. Sapir ([1921](#)) suggested a fourth type: *symbolic* languages. These languages utilize internal changes, such as ablaut, vowel and consonant changes, and changes in stress and tone, as a means of marking grammatical contrasts. This type has never been as widely used in typological classification of languages as the others, mainly because these internal changes are also widely used in fusional languages, and it is hard to draw a boundary.

(II) a large inventory of bound morphemes, together with a limited set of independent stems;

(III) derivational processes productive in the formation of individual sentences, the verbal word being a minimal sentence;

(IV) pronominal cross-referencing of subjects, objects, and sometimes also of other arguments (obliques, or datives) on the verb, and of possessors on nominal forms;

(V) integration of locational, instrumental and other adverbial elements (manner, etc.) into the verb complex as bound morphemes;

(VI) many possible affixal 'slots', just a few of them obligatory, within a verbal word.

Concomitant properties of polysynthetic languages include relatively free pragmatic constituent order, possibilities of variable morpheme ordering and head-marking.

Many, but not all, polysynthetic languages have noun incorporation (section 3). Most can have a wide range of recursively occurring affix types (verbalizers, nominalizers, adverbial type 'postverbs') with an extremely large overall stock of affixes (e.g. 400–500 in West Greenlandic, and 200 in Kwakwala). Yet other languages are typified by a large number of affixes attached to different slots only within a verbal complex ('field-affixing': Fortescue (1994:2602)). They can be suffixing (Yupik, or West Greenlandic), or suffixing and prefixing (e.g. Nadëb, from the Makú family; Guahibo languages from Colombia; or North Australian languages).

The combination of these properties is also attested. A combination of incorporation and 'field'-affixing can be illustrated with the structure of the verb complex in Traditional and Modern Tiwi (Osborne (1974); Lee (1987: 152–3)) – see table 1.1. (Modern Tiwi, spoken by the younger generation, has been simplified within a contact situation: Lee (1987:155–6).)

Example (4) shows a chain of prefixes in Traditional Tiwi. All these prefixes are said to be obligatorily used.

(4)   warta   a-watu-wuji-ngi-mangi-rr-akupuraji   yiripuwarta
       bush   3SG.MASC-morning-CONT-CV-water-CV-fall   high.tide
       'The high tide is falling [literally 'water-falling'] [exposing the]
       land (bush)' (Jennifer Lee, p.c.)

Historically, polysynthetic morphology often arises from the combination and subsequent grammaticalization of independent roots. Thus, Fortescue (1992) suggests 'that contemporary Eskimo languages may have developed their complex morphophonemic patterns from a more agglutinative pre-Proto-Eskimo stage' (cf. also Foley (1997) for Yimas; Aikhenvald (2003) for Tariana).

Since polysynthetic structures are most often found in head-marking languages, Nichols (1986) suggested that there are no polysynthetic nouns.

Table 1.1 *Morpheme slots in Tiwi verb (Lee (1987:152–5))*

Traditional Tiwi	Modern Tiwi
1. Subject	yes
2. Tense: past, non-past	yes
3. Locative: distant, directional, distant in time	yes
4. Mood 1: subjunctive, frustrative	yes
5. Mood 2: irrealis	yes
6. Temporal 1: 'in the morning'	no
7. Direct object or indirect object	no
8. Aspect 1: durative or non-past habitual, inceptive, common activity	yes
9. Stance: away from camp, or distant in time; walking along	no
10. Emphatic	yes
11. Connective	yes
12. Temporal 2: 'in the evening'	no
13. Concomitative	no
14. ± 1 or 2 incorporated forms	no
15. Verbal root	yes
16. Voice: causative, completive, reflexive, reciprocal	yes
17. Aspect 2: movement; 'on the way'	yes
18. Aspect 3: repetitive, past habitual	yes
19. Locative	no

However, nouns in some Australian languages (Dench and Evans (1988)) and in some languages from South America (Aikhenvald (1999c)) have been shown to be inflectionally polysynthetic, since they have multiple marking of grammatical function known as 'double case' (see also Plank (1995)).

The distinction between analytic and synthetic languages is a continuum rather than a dichotomy, since languages display different degrees of synthesis. The degree of synthesis or analysis in a given language can be calculated, for instance, by dividing the number of morphemes in a sentence by the number of words. Some languages are considered more synthetic than others. Linguists often talk about 'mildly' polysynthetic languages. This is reflected in the approach of Greenberg (1954) who suggested the use of a quantitative index, M(orpheme) per W(ord) to calculate the degree of synthesis in a language. See Comrie (1981a:44–5) for further discussion of problems which arise there.

Languages which can be considered almost entirely analytic are the isolating languages of Southeast Asia – e.g. Mandarin Chinese, Classical Chinese and Vietnamese – and of West Africa – e.g. Igbo. The languages of Europe, Asia and North Africa are predominantly synthetic, while polysynthetic languages are concentrated in North and South America, in Siberia, in the north of Australia and in some parts of Papua New Guinea (Foley (1986)).

2.3   Integrating the two parameters

The degree of synthesis and the treatment of morphological boundaries are relatively independent typological parameters. For a description of a previously undocumented language, it is not enough to say that it is 'analytic', or that it is 'isolating'. It is true that isolating languages tend to be analytic, but the reverse would be wrong: English, which has some fusional morphology, makes extensive use of analytic constructions.

Polysynthetic languages are often agglutinative in that the morpheme boundaries are clearcut, and there is little allomorphic variation. However, some polysynthetic languages do have elements of fusion. For instance, Greenlandic has a well-developed array of fused portmanteau inflections with a great morphophonemic complexity – see Fortescue (1992). The fusion of morphemes in a polysynthetic language is illustrated by (5), from Chiricahua Apache, an Athabascan language (Hoijer (1945:15)). Fused morphemes are underlined.

(5)   hà-ń-ʔàh
         out.of-2SUBJ+IMPF-handle.a.round.object+IMPF
         'you take a round object (out of enclosed space)'

The degree of morpheme fusion and of synthesis have to be defined independently of one another. Figure 1.1 illustrates how the two can be plotted together. Examples of languages are given underneath the diagram.

techniques of joining morphemes

fusional		3	5
agglutinating		2	4
isolating	1		
	analytic	synthetic	polysynthetic

number of morphemes per word
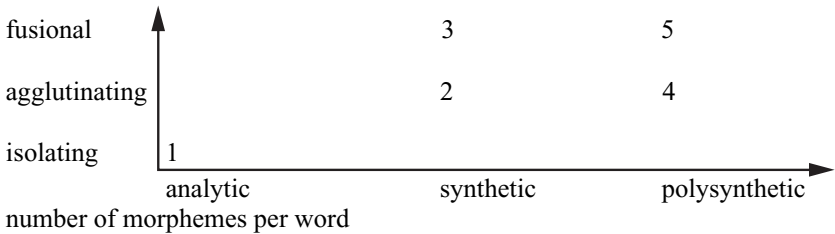
Figure 1.1   Interaction of two types of parameters in word-formation.

(1) Vietnamese and Classical Chinese are typical examples of isolating analytic languages.
(2) Hungarian is a typical agglutinating synthetic language.
(3) Russian is a fusional synthetic language.
(4) Yupik Eskimo is a polysynthetic agglutinating language.
(5) Chiricahua Apache is a polysynthetic fusional language.

2.4   *Word-formation and syntax in languages of different types*

The two sets of parameters illustrated in Figure 1.1 correlate with other properties. Isolating analytic languages tend not to have obligatory grammatical categories ordinarily shown in fusional or agglutinating languages, such as tense and case or agreement in gender or number (see examples (1–2) from Vietnamese).

As we will see in the following sections, compounding is widespread in isolating languages, while derivation is a property of languages of other types; this follows from the tendency to have a one-to-one correspondence between a morpheme and a word in isolating languages.

Analytic languages employ periphrastic constructions in syntax whereas synthetic languages tend to express similar meanings within an individual word by means of its affixes.

In Japanese, a synthetic language, passive – whereby the object of a transitive verb becomes the subject of an intransitivized verb and the original subject of the erstwhile transitive verb gets demoted – is expressed with an affix, as in (7). Example (6) is the underlying transitive clause.

(6)   Naomi-ga   Seiji-o ut-ta
           Naomi-SUBJ Seiji-O hit-PAST
           'Naomi hit Seiji'

(7)   Seiji-ga   Naomi-ni ut-are-ta
           Seiji-SUBJ Naomi-by hit-PASS-PAST
           'Seiji was hit by Naomi'

In contrast, an analytic language, such as Vietnamese, typically employs a periphrastic passive construction, as illustrated in (9), the passive of (8).

(8)   thây   pha   tôi
           teacher punish I
           'The teacher punishes me'

(9)   tôi bi   thây   pha
           I   suffer teacher punish
           'I am punished by the teacher'

English, also a fairly analytic language, tends to employ periphrastic constructions which correspond to affixal constructions in more synthetic languages. Examples (10) and (11) illustrate an active and a passive sentence, respectively, in Latin; translations show their English counterparts.

(10)   Mulier hominem   videt
       woman man+ACC.SG see+PRES+3SG
       'The woman sees the man'

(11)   Homo ā muliere   vidētur
       man   by woman+ABL.SG see+PASS+PRES+3SG
       'The man is seen by the woman'

Analytic isolating languages, such as Mandarin Chinese, tend to have no marking of grammatical relations other than constituent order (whereby 'the actor of a verb, if expressed, must precede the verb': LaPolla (1995:297)). Compare (12) and (13).

(12)   wǒ men tjɛɛn tsin
       I   PL play piano
       'We are playing the piano' (or 'we are playing the pianos', 'we are going to play the piano', etc.)

(13)   ta   da wǒ men
       s/he hit I PL
       'She or he is hitting us', 'she or he will hit us', etc.

Since the overt noun phrases are often omitted, the participants have to be inferred from the context. Thus, isolating languages are heavily context-dependent; it has been argued that in Chinese there has been no grammaticalization of the syntactic relations 'subject' and 'object' (see LaPolla (1995), for further discussion).

Numeral classifiers as independent words tend to occur in analytic isolating languages (Aikhenvald (2000)). A numeral classifier is illustrated in (14), from Hmong, a Hmong-Mien language from China (see Bisang (1993); Jaisser (1987:172)):

(14)   Lawv muaj rau tus   me nyuam
       they have six NUM.CL:LIVING.BEING child
       'They have six children'

When inanimate nouns appear with different classifiers, these highlight different aspects of their meaning. A well-known example from Burmese (Becker (1975:113)) illustrates this point. 'River' can be spoken of in at least eight contexts, shown in table 1.2. Numeral classifiers here are comparable to derivational affixes in more synthetic languages. The specific classifiers can thus add information about the referent, since they allow speakers to distinguish one sense of the referent from all the others. The 'repeater' classifier *myiʔ* – identical to the noun itself – in table 1.2 indicates that a river is looked upon just as a river, and

Table 1.2 *Reclassification of an inanimate noun in Burmese*

noun	numeral	classifier	translation
myiʔ	*tə*	*yaʔ*	'river one place' (e.g. destination for a picnic)
myiʔ	*tə*	*tan*	'river one line' (e.g. on a map)
myiʔ	*tə*	*hmwa*	'river one section' (e.g. a fishing area)
myiʔ	*tə*	*'sin*	'river one distant arc' (e.g. a path to the sea)
myiʔ	*tə*	*thwɛ*	'river one connection' (e.g. linking two villages)
myiʔ	*tə*	*pa*	'river one sacred object' (e.g. in mythology)
myiʔ	*tə*	*khu'*	'river one conceptual unit' (e.g. in a discussion of rivers in general)
myiʔ	*tə*	*myiʔ*	'river one river' (the unmarked case)

Table 1.3 *Classifiers as derivational markers in Tariana*

pa-da	*episi-da*	'one motor' (one round metal thing)
one-CL:ROUND	metal-CL:ROUND	
pa-kha	*episi-kha*	'one metal wire'
one-CL:ROPE.LIKE	metal-CL:ROPE.LIKE	
pa-pukwi	*episi-pukwi*	'one metal ring'
one-CL:ROUND.HOLLOW	metal-CL:ROUND.HOLLOW	

helps discard other senses (see further examples and discussion in Aikhenvald (2000:ch. 12)).

In synthetic languages numeral classifiers tend to be affixes. In some, such as Tariana, a North Arawak language from northern Brazil, affixed numeral classifiers can be attached to nouns themselves to form new words, as shown in the examples in table 1.3.

That is, analytic and synthetic languages employ different techniques to achieve the same end – enriching their lexicon. While synthetic languages rely on the internal structure of their grammatical words, analytic languages employ syntactic devices.

3 Noun incorporation

The term *noun incorporation* refers to morphological structures in which a nominal constituent is added to a verbal root, and the resulting construction is both a verb and a single word. Incorporation serves to derive lexical items. This process also has morphological, syntactic and discourse consequences, since it creates structures that often affect syntactic relations within a clause and have pragmatic functions in discourse. Incorporation is a morphological

process which brings word formation and syntax close together (see Mithun (1984)).

Incorporating languages are erroneously equated with polysynthetic languages. As was shown in section 2.2, polysynthetic languages do not always have incorporation. And languages with incorporation need not be polysynthetic – this is the case with numerous Austronesian languages such as Fijian or Mokilese. See Kroeber (1911), E. Sapir (1911), Sadock (1980), De Reuse (1994) and especially Mithun (1984, 1986, 1994) for detailed and illuminating accounts of incorporation.[2]

3.1   *Formal properties of incorporation*

Incorporating structures can be classified according to what type of material gets incorporated (section 3.1.1), and the degree of formal cohesion between the components (section 3.1.2).

3.1.1   *What material gets incorporated*

The incorporated nominal constituent can consist of (I) a free form of a noun, (II) a bare noun root, (III) a special suppletive or semisuppletive form, or (IV) a whole noun phrase.

3.1.1.1 (I)Incorporation of a free form of a noun.   In many languages the incorporated noun does not undergo any changes, as in (16), from Nadëb, a South American language from the Makú family (Weir (1990:323ff.)) where the noun 'house' gets incorporated, as compared to (15), where the same noun occurs on its own.

(15)   Subih t<u>ɔb</u>   t̃ɨh   ta-ma
          Subih house 1SG   THEME-make
          'I am making Subih's house'

(16)   Subih t̃ɨh   t<u>ɔb</u>-ta-ma
          Subih I   house-THEME-make
          'I am making a house for Subih'
          (literally 'I am house-making Subih')

3.1.1.2 (II)Incorporation of a bare noun root.   This is also a frequent type. Example (18), from Ngan.gityemerri, an Australian language (Reid (1990:190)), is an incorporated version of (17). The incorporated noun, 'leg', has been stripped of its noun class prefix *da-* which can be seen in (17).

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[2] Unmotivated extensions of this term to various kinds of derivations abound in Baker (1988, 1995).

(17)   ngudeny-fityi   da-<u>garri</u>
       1SG.SUBJ.PERF.shove.DTR-roll   NCL-leg
       'I crossed my legs'

(18)   ngudeny-<u>garri</u>-fityi
       1SG.SUBJ.PERF.shove.DTR-leg-roll
       'I crossed my legs'
       (literally 'I am cross-legged')

3.1.1.3 (III)Incorporation of a suppletive or reduced stem.   Special sup-
pletive or semisuppletive stems, distinct from the noun root, are found in a few
Northern Australian languages. Example (19), from Traditional Tiwi, illustrates
the incorporation of two constituents (Lee (1987:164)). The free form for incor-
porated *kiji* 'stick' is *taɲini* (Osborne (1974:49)), and that for *maripi* 'chest' is
pipwa (1974:50).

(19)   nga-mpi-ri-<u>kiji</u>-<u>maripi</u>-rrituwa
       we(INCL)-NP:her(DO)-CV-<u>STICK</u>-<u>CHEST</u>-slit.open
       'We slit the chest [of a goose: FEM] with a stick'
       (literally 'we chest-stick-slit-her')

An incorporated form can be a truncated version of the free-form noun. In
Murrinh-Patha (Australian; Walsh (1996); Knight (1993:43)), the free form
lamala 'shoulder' is incorporated as *mala*, and *nginipunh* 'internal body' as
ngini. Palikur, a polysynthetic Arawak language from Brazil and French Guiana,
has a closed set of incorporated body parts. Some of them coincide with the
full noun, e.g. *duk* 'chest', and some get shortened and undergo idiosyncratic
changes, e.g. free *kugku*, incorporated *kug(a)* 'foot'; free *utyak*, incorporated
-(h)ot(a) 'eye' (Aikhenvald and Green (1998)).

3.1.1.4 (IV)Incorporation of the whole NP.   This type of incorporation is
not at all frequent. Incorporation usually takes place when the head noun
of a noun phrase is neither specific nor referential. Example (20), from
Boumaa Fijian (Dixon (1988:227)), illustrates how a whole possessive noun
phrase – '*e-dra-i'a* meaning 'their fish' – can get incorporated (cf. (33), from
Nahuatl).

(20)   saqa.-['e-dra-i'a]
       cook-[their-edible.thing-fish]
       '[they will return home and] cook their fish'

Example (21), also from Boumaa Fijian, shows incorporation of an attributive
noun phrase consisting of a noun and an adjective.

(21)   'ana-[waci-po'i]
         eat-[cooked.taro.leaves-rolled]
         'eat rolled taro leaves'

In Fijian it is even possible to incorporate a noun phrase with an 'or' disjunction.

(22)   e   la'i taa-[niu-se-bu'a]
         ASP go   chop-[copra-or-firewood]
         'He's gone to chop copra or firewood'

A comitative noun phrase can be incorporated in Rembarrnga, an Australian language (McKay (1975:171)), as in (23).

(23)   ŋa-[parta-winta]-rtuŋ?-miñ
         1SG.S-[spear-COMITATIVE]-fall-PUNCTUAL
         'I fell with a spear [sticking out of me]'

3.1.2   *The degree of formal cohesion between components*
There are two possibilities. A verb and a nominal constituent can be juxtaposed, but remain separate phonological words, as in numerous Austronesian languages (see Mithun (1984:849–50)). Example (24), from Boumaa Fijian (Dixon (1988:227)), is a transitive sentence where the object noun phrase refers to some specific breadfruit. Example (25) contains an incorporated noun phrase which is an independent phonological word. Unlike (24), (25) is an intransitive sentence referring to a generalized activity of 'breadfruit-eating' rather than eating any particular breadfruit. The incorporated noun has lost its syntactic status as an argument of the verb (direct object) and it cannot be modified with an article, or have specific reference.

(24)   e   'ani-a   a   uto
         3SG.A eat-3SG.O ART breadfruit
         'He is eating the/some breadfruit'

(25)   e   'ana-uto
         3SG.A eat-breadfruit
         'He is eating breadfruit'
         (literally 'is engaged in breadfruit-eating')

Alternatively, the formal cohesion between the incorporated noun and the verb can be tighter: they constitute one phonological word and take a single stress, as in Ngan.gityemerri (18), Tiwi (19) and Nadëb (16). In (26), from Cayuga (Iroquoian; Mithun (1994)), the incorporated noun 'berry' enters into the syllable count for the purpose of stress assignment (the fourth syllable is stressed), and participates in laryngeal spreading, a phonological process

whereby vowels within one phonological word become laryngealized (shown by the dot underneath every vowel).

(26)   kạhyakwạhskẹ̃hẹ̃:ʔ – surface realization
         k-ahy-kw-ahs-kẹ̃hẹ̃:ʔ – underlying form
         1.AGENT-berry-get-HABITUAL-FORMER.PAST
         'I used to berry-pick'

3.2   Functional types of incorporation

We can distinguish five functional types of incorporation (roughly following Mithun (1984, 1994)).[3]

3.2.1   Type 1. Lexical compounding

If a language has any noun incorporation at all, it has lexical compounds. Lexical compounding is derivation of a complex lexical item from a combination of two or more stems to refer to a 'name-worthy' unitary activity, such as 'berry-picking' in (26). Lexical compounding often derives intransitive verbs. Consider (27) and (28), from Mokilese, an Austronesian language (Harrison (1976:162)) (cf. also (24) and (25) above). Example (27) contains a specific noun phrase with a determiner: 'these coconuts'.

(27)   Ngoah   kohkoa   oaring-kai
         I   grind   coconut-these
         'I am grinding these coconuts'

The noun 'coconut' is incorporated in (28). This sentence refers to a habitual activity of grinding coconuts, and cannot refer to any particular individualized coconuts.

(28)   Ngoah   ko-oaring
         I   grind-coconut
         'I am coconut-grinding'

Verb-object compounds are extremely productive in Mandarin Chinese, e.g. *jié-hūn* (tie-marriage) 'marry' and *kāi-dāo* (open-knife) 'operate on' (Li and Thomson (1981:75–7)). Verb-subject compounds in Mandarin Chinese involve intransitive adjectival verbs, e.g. *xīn-ruǎn* (heart-be.soft) 'be softhearted', *mìng-kǔ* (life-be.bitter) 'be unfortunate'; only some are action verbs, e.g. *tóu-téng* (head-ache) 'have a headache', *bīng-biàn* (soldier-rebel) 'mutiny', *dì-zhèn* (earth-quake) 'have an earthquake' (1981:71–2). There are hardly any examples of compounding of transitive subjects.

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[3] Type 1 here corresponds to Mithun's type I; type 2 and type 3 to her types II and III; type 5 to her type IV (classificatory noun incorporation); type 4 has not been considered in her paper.

The semantics of compounds is often non-compositional, e.g. Korean *kil-tulta* (road-enter) 'get used to'. One of the criteria for verb–object compounds in Mandarin Chinese involves the non-compositionality of their meaning (Li and Thomson (1981:71–2)).

Compounding is typically used for 'naming' some important activity, e.g. *baby-sit* (but not *pig-sit*, unless someone employs someone else to take care of an unusual pet), *fund-raise, home-deliver, problem-solve*, and Boumaa Fijian *unu-wai* 'drink water' (water-drink) (Dixon (1988)). Lexical compounds of this sort may have to be entered into a dictionary as separate lexical items, since their meaning is often non-compositional, e.g. Hungarian *világ-latszani* (world-see) 'travel'; Paumari (Arawá, Brazil) *-va'i-hoki* (liver-be.alive) 'remember'; Mayali (Australian; N. Evans 1991, 1996) *ngei+bu* 'flower+hit' 'to flower' and *danj+bu* (spear+hit) 'to spear'.

To understand the meaning of non-compositional compounds one has to be familiar with the culture. For instance, Boumaa Fijian *unu-tii* (lit.: 'drink tea') is a lexical compound which in fact refers to something more than just tea-drinking: it means a small meal 'in which tea drinking is accompanied by eating bread, scones or pancakes'. A compound *unu-sede* literally means 'drink money (cents)', and 'describes a kava-drinking party where each participant contributes a small sum, perhaps twenty cents, in order to raise money for a specific purpose' (Dixon (1988:227)).

3.2.2   *Type 2. The manipulation of case*

The incorporation of an argument can have a syntactic effect; then it results in the change of syntactic relations within a clause. Consider (15) and (16) from Nadëb (Makú). As a syntactic position was vacated by the incorporated nominal, 'house', the erstwhile possessor, Subih, gets 'advanced' into the position of the direct object.

The manipulation of case often also has concomitant semantic and pragmatic effects. That is, incorporation permits speakers to cast important participants into core roles – S or O.[4] The semantic difference between (15) and (16) in Nadëb is that in (16) the benefit for Subih is considered more important than building a house. In (29), from Cayuga, the victim of 'scalping', which is 'presumably, of greater overall interest than the scalp' – since the story centres around the human protagonists and not their body parts – can occupy a core case role due to incorporation (Mithun (1994:5025)).

(29)   a-t-he-nõh-hk
          FACTUAL-DUAL-1SG.AGENT/M.SG.PATIENT-scalp-pick
          Literally 'I scalp-picked him', that is, 'I scalped him'

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[4] In this chapter I employ the standard abbreviations S (intransitive subject), A (transitive subject) and O (transitive object). Some other writers use P or U instead of O.

3.2.3   Type 3. The regulation of information flow

Incorporation is often used to background known or unimportant information in discourse (see also the Cayuga examples in Mithun (1994:5025)). In Nahuatl (Uto-Aztecan; Merlan (1976)) a new entity is introduced by an independent ('external') noun phrase, as in (30).

(30)   askeman ti-'-kwa   nakatl
         never   you-it-eat   meat
         'You never eat meat'

Once the noun is old information, it is incorporated, as in (31) from the same conversation as (30).

(31)   na' ipanima ni-naka-kwa
         I   always   I-meat-eat
         'I always eat meat'

The incorporated noun in Nahuatl (Merlan (1976:188)) is unmarked for features such as definiteness or specificity. Only non-incorporated nouns can be contrastive, as in (32); compare the incorporated counterpart in (33).

(32)   ni-ki-išmati   itos
         1sg-it-know   3sg+voice
         'I know him by his voice' (and not in some other way)

(33)   nitos-išmati
         1sg+3sg+voice-know
         'I know his voice'

3.2.4   Type 4. Incorporation of modifiers

Incorporation of a modifier is found in some Australian languages. Adjectival modifiers can be incorporated only if the head noun is the subject of an intransitive verb, as in (34), from Rembarrnga (Australian; McKay (1975:290)), or a direct object, as in (35), from Mayali, also Australian (N. Evans (1996:102)).

(34)   Ø-kartpurr-mañ
         3.min.subj-wounded-went
         'He [buffalo] went away wounded'

(35)   barri-darrgid-ma-ngi
         3.augm/3-alive-pick.up-pi
         'They pick [it, i.e. a crocodile] up alive'

3.2.5   Type 5. Classificatory incorporation

A generic noun can be incorporated to narrow the scope of the verb characterizing its direct object or the intransitive subject. Semantically this is similar to

generic noun classifiers (see Dixon (1982); Aikhenvald (2000:ch. 3)); cf. (36), from Mayali:

(36) ga-rrulk-di   an-dubang
      3NP-GEN.CL:TREE-stand   CLIII-ironwood.tree
      'An ironwood tree is there'
      (literally 'An ironwood tree tree-stands')
                                (N. Evans (1996:77))

An incorporated noun can get grammaticalized as a verbal classifier, categorizing the argument (O or S) in terms of its shape (cf. Mithun (1984); Aikhenvald (2000)). Mundurukú, a Tupí language from Brazil (Gonçalves (1987: 42)), has over 100 classifiers which refer to shape and form; most of them come from body-part nouns. In (37), classifier $-ba^4$ 'long and rigid' refers to O ('banana'); it comes from a body-part term meaning 'arm'.[5]

(37) $Be^3kit^2kit^2$ a^2ko^3-ba^4 o^3-su^2-ba^2-do^{3}bu^{2}xik^3
      child   banana-CL:LONG.RIGID   3SG-POSS-CL:LONG.RIGID-find
      'A child found a banana'

One language may have more than one type of noun incorporation. This is an important argument in favour of the proposed typology. Different types of noun incorporation can differ just in their semantics. Retuarã, a West Tucano language from Colombia, has type 1 and type 2 incorporation. If an incorporating structure describes a customary activity, lexical compounding (type 1) is employed, yielding combinations like firewood-feed = make fire; medicine-put = treat; or (38):

(38) kopakaha   dã-<u>tã?ãpi</u>-hãã-ti-ko?o
      now   3PL-<u>coca</u>-put.it-PERF-PAST
      'Now they have chewed-coca'

If the activity is not customary, type 2 incorporation (manipulation of case) occurs as in (39) (Strom (1992:100)). In this example the noun 'seat' is incorporated into the verb 'put', and 'canoe' becomes a direct object: it is cross-referenced on the verb with the prefix *sa-* 'third person inanimate singular object':

(39) bikitoho   sa-ki-<u>terí</u>-hãã-rãyũ)
      morning   3INAN.SG.O-3MASC.SG.A-<u>seat</u>-put-future
      'In the morning he will put seats in it (canoe)'
      (literally 'he will seat-put it')

According to Mithun (1984), there are hierarchical relations between the types of incorporation. If a language has classificatory noun incorporation

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[5] Note that numbers indicate tones, with 1 being high tone and 4 low tone.

(type 5), it will also have incorporation as regulation of information flow (type 3), as well as case manipulation incorporation (type 2) and lexical compounding (type 1). This implicational hierarchy suggests a path for the evolution of noun incorporation. Noun incorporation starts from lexical compounding, and then goes through other types, with classificatory noun incorporation as its latest stage.

3.3 *Syntactic functions of incorporated nouns, and their incorporability*

Incorporated nouns typically are in S (intransitive subject) or O (direct object) (see Keenan (1984), and examples (16–39)). According to Mithun (1984:875), if a language incorporates nouns in just one function, they will be direct objects; if a language incorporates only two types of arguments, they will be direct objects and subjects of intransitive verbs; many languages also incorporate instruments and also locations. Example (40), from Chipewyan, an Athabascan language, illustrates the incorporation of an instrument, 'hook' (Cook and Wilhelm (1998:59)). Example (41) contains the same noun as a free form. Incorporated forms are used if the action is more habitual, with little specification of the incorporated participant.

(40)   na-jéth-the-Ø-Ø-da
        ITER-hook-M/A-3SG-VCL-sit
        'S/he is fishing again'
        (literally 'sitting with a hook')

(41)   jéth   ghạ   the-Ø-Ø-da
        hook with M/A-3SG-VCL-sit
        'S/he is fishing'
        (literally 'sitting with a hook')

The subject of transitive verbs can hardly ever be incorporated.[6] Alamblak (Sepik Hill, Papuan; Bruce (1984:170)) is unusual in that it permits the incorporation of a body part whose possessor is in A function. Example (42) is a transitive sentence with two unincorporated arguments, 'child' and 'foot'. In (43), the A ('foot') is incorporated into the verb. This is incorporation of type 2, since it includes manipulation of case with semantic and pragmatic consequences: (42) is about the child's foot, and (43) (an intransitive clause) is about the child.

(42)   yën-r   wura-t   yëhne-më-t-r   moh-ohat-n
        child-3SG.M foot-3SG.F descend-R.PST-3SG.F-3SG.M hole-path-S.SET
        'A child('s) foot went down the hole on him'

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[6] Verbal classifiers operate similarly; only in a few exceptional cases do they characterize A; see Aikhenvald (2000) on Motuna and Nasioi, Papuan languages from Bougainville; see also Onishi (1994).

(43) yën-r   wura-yëhne-më-r   moh-ohat-n
      child-3SG.M foot-descend-R.PST-3SG.M hole-path-S.SET
      'A child went down into the hole (up to his) foot'
      (literally 'child foot-descended into the hole')

Different constituents may be incorporated under different conditions. In Alamblak (Bruce (1984)) any noun in S, O or locative function can be incorporated in a dependent clause; while in a main clause only inalienably possessed nouns can be incorporated.

Body parts and relational nouns (e.g. terms like *child-of*) are more likely to be incorporated than nouns of other semantic groups (see Zhivov (1978); see Merlan (1976:188) for a functional explanation). In many languages only body-part nouns can be incorporated (e.g. Australian languages – N. Evans (1996), Walsh (1996) – or Palikur, an Arawak language from Brazil – Aikhenvald and Green (1998)). In most Amazonian languages (Guahibo, Nadëb) only obligatorily possessed nouns can be incorporated.

In most cases, members of closed classes cannot be incorporated. Boumaa Fijian is unusual in allowing lexical incorporation of the interrogative *cava* 'what', as in *unu-cava* 'drink what?' (Dixon (1988:227)). Further restrictions on incorporability of nouns follow from their referential properties. Definite or referential nouns cannot be incorporated. This is the reason why personal names are rarely (if ever) incorporated.

Some languages allow more than one constituent to be incorporated simultaneously; see Walsh (1996:358) on incorporating two body-part terms in Murrinh-Patha, and example (19), from Tiwi. Nadëb allows the incorporation of various constituents with the pragmatic result that the 'new' direct object comes into focus (see (15) and (16)). It is also possible in Nadëb to incorporate two or even three nouns, but this is not common (Weir (1990: 332)). Example (44) illustrates two incorporated nouns:

(44) a   hoonh   kad   tɔb-nooh-ga-jɨtt
      2SG+POSS   grandmother uncle house-mouth-THEME-close
        dɨk
        be.suspended
      'Uncle closed the door of your grandmother's house'
      (literally 'Uncle house-mouth-closed your grandmother';
      the effect on the grandmother is emphasized)

Adverbs and adpositions (prepositions or postpositions, depending on the language) can form part of lexical compounds (type 1 incorporation), e.g. English *overdo*, *outdo*, *underrate*. Incorporation of adverbs and adpositions is often used as a valency-changing device (similarly to type 2, manipulation of case). Incorporation of an adposition in Nadëb is functionally

similar to applicative. If the verb is intransitive, the argument of the postposition becomes O, and the original S becomes A. Example (45) is intransitive, and (46) is transitive.

(45)   εε_S   a-hɨng   [hxɔɔh go]
        father FORMATIVE-go.downriver canoe   in
        'Father goes downriver in a canoe'

(46)   hxɔɔh_O εε_A   <u>ga</u>-hɨng
        canoe   father <u>in</u>-go.downriver
        'Father goes downriver in a canoe'
        (literally 'Father goes-downriver-in a canoe')

This incorporation has a syntactic effect: an argument of a postposition cannot be relativized, but a direct object can be (see above). It also has a discourse effect: a direct object is more topical than an argument of an adposition.

We have seen that incorporation is a means of enriching the lexicon: lexical compounding serves to create new lexemes. It may also have a syntactic effect, altering grammatical relations within a clause. Its pragmatic effect has to do with highlighting a new participant or backgrounding an old one. Finally, incorporation can also have a stylistic effect: for instance, constructions with incorporation have been described as 'more idiomatic, more elegant' for Carrier, an Athabascan language (Cook and Wilhelm (1998):61)) (see section 7.5).

4   Structure and iconicity in word-formation

The notion of structure in word-formation implies that some items in the lexicon can be considered partially motivated in terms of an association between their form and their meaning. Some words in a language are 'unanalysable'; the association between form and meaning is conventionalized by speakers' usage. Other words consist of isolable parts with form and meaning of their own combined in a principled way.

Languages differ in how much derivational motivation (and hence derivational complexity) they allow for individual words. For instance, the body-part terms *eye*, *beard* or *moustache* in English are not decomposable; the association between their phonological form and their meanings can be considered arbitrary. In contrast, the word *eye-lash* consists of two parts, *eye* and *lash*, each of which relates to an independent word. The existence of parallel formations in the language (e.g. *eye-brow*, *finger-nail*, etc.) confirms the idea of the *regularity* of the relationship between *eye* and *lash*. Decomposable terms in some languages can correspond to non-decomposable ones in others, e.g. Portuguese *cílio* 'eyelash'. Similarly, non-decomposable items in English such as *beard* or *moustache* correspond to composite structures in Tariana (Arawak,

Northwest Amazonia) *si-numa* (hair-mouth) 'beard' and *si-numa-whi* (hair-mouth-classifier:hair.like) 'moustache'. Some kinds of words are formed either by derivation or by compounding, or tend to have a complex internal structure, while other kinds tend not to. In many European languages this is the case with basic relational terms such as mother, father or parent, or terms for eye, ear or head. In contrast, in Tariana and the Tucano languages from South America, terms for 'father' and 'mother' are derived from the root for 'parent' (see Aikhenvald (1999a)). This is a topic for a separate study.

The morphemes which form new grammatical words can be classified according to their functions and their semantic and combinatorial properties – such as the capability of functioning on their own, or of co-occurring with other morphemes. Structural patterns of word formation may occur at many places in a language, that is, be productive, or they may be attested just sporadically. The meaning of a composite word can be compositional, that is, consist of the sum of meanings of the parts – and thus be predictable – or not (see section 7).

The structural transparency of word-formation goes together with *iconicity*.

Morphemes and morphological processes can be iconic in a number of ways. One is *lexical iconicity*. Imitative forms used to express a sound are often sound-symbolic (see Hinton, Nichols and Ohala (1994):10)), e.g. *bow-wow*; the imitation of bird cries in words like English *twitter*, *chirp*; German *zwitschern*; Russian *čirik-at'*; Modern Greek *teret-izo* (Dressler (1987):101)); or the imitation of the actual sound in Russian *oh-at'* 'say "oh" as a sign of distress', or Tariana *ɨh-meni* 'say "ih" [a frightening sound]'. Many bird names originate in imitative forms, e.g. English *cuckoo*, Tariana *kerekere* 'sparrow' (see further examples in Berlin (1994)). Further examples of iconicity within the lexicon are given by Crowley (1992:35–7).

Groups of roots or affixes which arguably contain a sound-symbolic (or iconic) formative smaller than a morpheme constitute a problem for morphological analysis. It is intuitively clear that they have a meaning of their own and can be considered independent segments; however, there is usually not enough evidence as to their semantic unity and recurrence. These sound-symbolic formatives – in which 'certain sounds are particularly appropriate to suggest certain physical effects, and will do so if they occur in words whose meaning invites the suggestion' (V. Adams (1973):145)) – are known as phonesthemes, e.g. *fl-* in *flip*, *flap*, *flop*, *flitter*, *flimmer*, *flicker*, *flutter*, *flash*, *flush* (Bloomfield (1933):156)), or *sn-* in English *sneeze*, *snuff*, *snarl*, or *sl-* in *slide*, *sleek*, *slither*, *slip*, *slap*. See also Bolinger (1950) for the analysis of phonesthemes and the role of rime and assonance in morpheme analysis as well as in creating new words. Joseph (1994) provides an insightful analysis of two putative phonesthemes in Modern Greek, *[ts]* and *[dz]*. The words which contain these 'primary exponents' of sound symbolism cover the meaning 'small, narrow', e.g. *tsíxla* 'thin woman', *tsíta-tsíta* 'just, barely'; diminutive suffixes, such as *-ítsa*, or *-dzikos*; words

referring to deformity, or deficiency; words belonging to the semantic field of 'sting, bite, tease, burn'; and a few more groups. These are arranged into the following semantic 'relatedness network' (here somewhat simplified), akin to a prototype/extension model:

DEFORMITY

DWARF —————— SMALL —— TIGHT —— MISER

STING

BURN   BITE
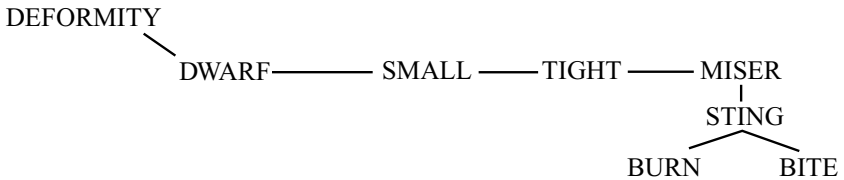
There is by now no doubt about the psycholinguistic reality of sound-symbolic elements (Hinton, Nichols and Ohala (1994)). However, the exact semantic links underlying each of them, as well as their morphological status, require further investigation.

Lexical iconicity is not limited to roots or stems; affixes which are derived from onomatopoeic roots may retain their sound-symbolic form (e.g. Tariana verbal suffix -*hu* 'brisk movement away from something', derived from the adverb *hu*, with a similar meaning). Diminutive and augmentative formations are often considered sound-symbolic: high closed vowels tend to be employed in diminutives, while augmentatives tend to use low open vowels, e.g. Classical Nahuatl -*pil* 'diminutive', -*pol* 'augmentative' (L. Bauer (1996):192)). See also Aoki (1994:16–17) on vowel and consonant symbolism in diminutive formation in Nez Perce; Bolinger (1950:136), on the vowel 'phonestheme' 'relating to size' (/i/ for smallness, etc.); and Mayerthaler (1981:99ff.).[7]

Lexical iconicity should be distinguished from *derivational iconicity* which involves an intuitively predictable correlation between a derivational process and its semantics. Reduplication is often iconic. In Turkish, partial reduplication of adjectives has an intensifying meaning, e.g. *mavi* 'blue', *masmavi* 'bright blue', *kara* 'black', *kapkara* 'completely black'. Reduplication denotes plurality of nouns in Tamambo, an Oceanic language (Jauncey (1997:31)), e.g. *tahasi* 'stone', *taha-tahasi* 'stones'.

However, derivational iconicity is often limited. The reduplicated verbal stem in Hebrew (as well as in other Semitic languages) has the meaning of intensity, but it can also have a causative meaning and can derive denominal verbs; thus, it is often semantically unpredictable.

In Oceanic languages, reduplication typically has different semantic effects depending on the word class it applies to. For instance, in Tamambo, besides

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[7] Bauer (1996) shows that there is no evidence for a cross-linguistically valid universal pattern of sound symbolism in diminutives and augmentatives, and that iconic relations must be proved in each case based on language internal criteria.

marking plurality of nouns, the initial CVCV is also used to express the 'intensive quality' for adjectives of physical property, human propensity and value, e.g. *baru* 'fat', *baru-baru* 'very fat', and is also used to derive intransitive verbs from nouns (e.g. *bange* 'stomach', *bange-bange* 'be pregnant'). And Jarawara (Arawá, Southern Amazonia) has three types of reduplication, each of which has a different meaning: initial CV-, initial CVCV-, final -CV, e.g. *horo* 'pull', *ho-horo* 'pull a little bit', *horo-horo* 'pull with great force', *horo-ro* 'keep on pulling, hand over hand, until the end' (Dixon and Vogel (1995)). Each can be considered derivationally iconic, albeit in its own idiosyncratic way.

Another aspect of iconicity is *diagrammaticity* or *structural iconicity* (Wildgren (1982)). If the morphological segmentation into root and affix is straightforward (as in the case of most agglutinating languages: see section 2), the morphological motivation of word formation is diagrammatic. The lack of diagrammaticity results in morphotactic opacity. Phonemic modifications then obscure the morphemic boundaries. This often happens in fusional languages. For instance, in Ancient Greek *anassa* 'queen, lady' is derived from *anak-s* 'lord' (the underlying form of *anassa* is *anak-ja*); however, this derivation became opaque due to the morphophonemic process $/k + j/ \rightarrow /ss/$ (for further examples see Dressler (1987:103)).

5   Compounding

Compounding involves word-formation based on the combination of at least two potentially free forms, most frequently members of open lexical classes such as nouns or verbs, e.g. English *fox-hunting*, *stationmaster*, or German *Briefkastenschlüssel* 'letter box key'. They differ from phrases in a number of ways (section 5.1). Nominal compounding results in the creation of new nouns (section 5.2), while verb compounding forms new verbs (section 5.3). Other word classes also employ compounding (section 5.4). Compounds may get lexicalized and their structure then becomes obscured – see section 8.

Compounding is found in languages of any type, but is dominant in isolating languages.

5.1   *How to distinguish compounds from phrases*

The types of criteria used to distinguish compounds from phrases are (I) phonological; (II) morphological; (III) morphosyntactic and (IV) semantic. None of these criteria is universal. Compounds have to be defined on language-internal criteria. Orthographical conventions may be helpful (for languages with a tradition of writing). Compounds are often written with a hyphen, or as one orthographic word.

5.1.1   (I)Phonological criteria

Unlike phrases, which consist of several phonological words, compounds often form one phonological word and thus have just one stress. In English, compounds are stressed on the first of two elements, e.g. *hótdog* (as opposed to a *hót dóg* 'a dog which is hot'), *bóathouse* (cf. the difference between English *bláckbird* and *bláck bírd* discussed by Bloomfield (1933:180)). In Buru (Austronesian; Grimes (1997:280–1)), compounds form one phonological word and are characterized by single stress, e.g. *tón.boti* 'white cuscus' (a particular species by that name) versus *tónal bóti* 'white cuscus' (a cuscus which is white). In Dâw (Makú), a tone language, compounds receive just one tone, e.g. *daw-tóg* (person-daughter) 'girl' (as compared to a coordinate noun phrase *dâw tóg* 'a person and a girl' where each component has tone of its own).

In tone languages, compounds may also differ with respect to the distribution of tones. In Comaltepec Chinantec (J. L. Anderson (1989):56)), the tone of each syllable of a compound may be distinct from nouns as they appear free, e.g. $lo:^L$ 'skin' + gui^{LH} 'head' > $lo^L gui^{HM}$ 'hat'. In the Wu dialects of Chinese, compounds differ from phrases with respect to tone sandhi (S. R. Anderson (1985a:41)).

However, phonological structure may not be criterial by itself. In Boumaa Fijian (Dixon (1988):226)), parts of compounds are still independent phonological words (e.g. *cagi.laba* 'cyclone', lit.: 'murdering wind', from *cagi* 'wind' and *laba* 'murder', where '.' is a boundary between two phonological words). In Portuguese (Sandmann (1988):130)), there is no difference in stress patterns between compounds and non-compounds, e.g. *pé-de-moleque* (foot-of-boy) 'peanut brittle' and *pé de moleque* 'foot of a boy'. In these cases criteria (II) to (IV) have to be used.

Different criteria may be used for different compound types. Modern Hebrew has at least two types of nominal compounds. Those formed by simple juxtaposition of two nouns constitute one phonological word, e.g. *migdalór* (*migdal* 'tower', *or* 'light') 'lighthouse', *madxom* (*mad* 'measure', *xom* 'heat') 'thermometer', *šmar-taf-it* (keep-child-FEM) 'baby-sitter'; in some there is fusion on the boundaries, e.g. *kadurégel* (*kadur* 'ball', *regel* 'foot') 'football' (see Aikhenvald (1990):55)). The other type of compound formally identical to a possessive construction consists of two phonological words, e.g. *bet sefer* (house.of book) 'school', *gan yeladim* (garden.of children) 'kindergarten' (see Berman (1978:234–5); Borer (1988)). These compounds are formally indistinguishable from possessive constructions, such as *bet Rina* 'Rina's house' (Berman (1978:234)). See criteria (III) and (IV), for the ways in which they are morphosyntactically and semantically different from possessive noun phrases.

5.1.2   (*11*)*Morphological criteria*

Compounds are often recognizable on morphological grounds. In Estonian, the first element of a compound cannot be further inflected or modified; the compound belongs to the same word class as its final member (see Lehiste (1964)). In other languages, compounds can be recognized by the presence of linker morphemes found only in compounded structures, e.g. Russian *-e*/*o*, as in *jug-o-zapad* (south-linker-west), 'southwest'; or Tagalog (Western-Austronesian; Schachter and Otanes (1972):107)) *-ng-*, as in *ngipin* 'tooth' + *ng* 'linker' + *aso* 'dog' (teeth like a dog), 'sharp teeth'. In German, an additional morpheme (*-e*, *-en* or *-s*) is often inserted between the components of a compound. These endings resemble genitive markers; but they are synchronically different for certain words, e.g. the compound *Schwanen-hals* (swan.LINKER-neck) 'swan's neck' (*Schwans* being the genitive form of 'swan'). The gender of a compound is determined by that of its last component.

Compounds may be recognizable by the presence of unusual forms not found elsewhere in the language, e.g. *nais-* 'woman-' in Estonian *nais-kirjanik* 'woman-writer'; Hebrew *šmar-* in *šmar-taf-it* 'baby-sitter'; *thru-* in English *thrupence*, archaic form of 'three (old) pence'; or *-dni* in Russian *trídni* 'three days' (archaic).

Compounds can be characterized by the absence of a marker of syntactic dependency, cf. the absence of possessive preposition *de* 'of' in Portuguese *ponta-pé* 'a kick' (lit: 'top of foot'). In languages with root and pattern morphology (see section 6.3.2), compounded roots may take a single derivational vocalic pattern, e.g. Modern Hebrew *balšan* 'linguist' (consonants from the two roots, *b-l* 'master' and *l-š-n* 'language', plus vowel pattern and suffix of an agent noun: $C_1aC_2C_3$-*an*).

Compounds often take just one marker for inflectional categories, e.g. Russian *carj-devica* 'heavenly girl' (lit: 'king-girl'), nominative plural *carj-devic-y*, accusative singular *carj-devic-u*; Portuguese *pontapé-s* 'kicks'.

They typically have fixed constituent order, which may be distinct from the order in noun phrases, as in Kana, from West Africa (Ikoro (1996):107)). This is also true of English compounds. In independent clauses English has a fixed constituent order AVO, while the order in compounds such as *house-keep*, *fund-raise* is strictly OV (it is VO in such compounds as *killjoy* or *pickpocket*). Similarly, adverbs typically appear after the verb; but in compounds (e.g. *home-deliver*) they are used preverbally.

These criteria may not always apply. Some compounds in Portuguese mark plural on both components, e.g. *matéria prima* 'raw material', pl. *matéria-s prima-s* 'raw materials'. In Hungarian, some compounds take just one case marker – e.g. *hír-lap* (news-leaf) 'newspaper', accusative *hír-lap-ot*, *bú-banat* (sorrow-sadness) 'sorrow', accusative *bú-banat-ot* – whereas others case-mark

both components, e.g. *hédy-völdy* 'mountains and valleys', accusative *hédy-et-völdy-et*.

5.1.3 (III)Morphosyntactic criteria

Other morphemes (with the exception of the case markers mentioned above) usually cannot be inserted in between the components of a compound, such as Fijian *cagi-laba* 'cyclone'. Components of compounds usually cannot be modified. In Modern Hebrew, (47) is ungrammatical, because *gan yeladim* 'kindergarten' is a compound (Borer (1988:49)). Example (47) cannot mean 'small garden' because of the plural agreement form of the adjective 'small'.

(47)   *gan   yeladim ktanim
        garden child.PL small.PL
        ?garden of little children?

Compounds of this type in Hebrew do not allow coreferential deletion of their components in coordination; (48) is also ungrammatical – see Borer (1988:51) on the non-acceptability of the coordination **fire- and milk-man* in English.

(48)   *gan   yeladim ve-xayot
        garden child:PL and-animals
        ?kindergarten and zoo?
        (literally 'garden of children and animals')?

Along similar lines, in Portuguese, components of compounds cannot be modified separately, or undergo coreferential deletion; thus, the compound *fim-de-semana* 'week-end' can only take a modifier as a whole, e.g. *fim-de-semana bonito* 'nice weekend', and not **fim bonito de semana*, or **fim de semana bonita* (Sandmann (1988:132)) (where *bonito* is the masculine form of an adjective which agrees with the head of the compound, *fim* 'end', and *bonita* is the feminine form agreeing in gender with *semana* 'week').

In contrast, other languages allow parts of compounds to undergo coreferential deletion in coordination, e.g. German *Diminutiv- und Augmentativ-bildung* 'formation of diminutives and augmentatives' (the title of Ettinger (1974)), and Finnish *joulu-, tammi- ja helmi-kuu* 'December, January and February' (lit.: 'Christmas-, oak-, and pearl-month').

In some languages, such as Russian, parts of some compounds can be externally modified. In *mest-o-bljustitelj patriarh-a* (place-LINKER-keeper patriarch-GENIT) 'a person who fulfils the duties of the patriarch of the Orthodox Church in his absence' (lit.: 'the keeper of patriarch's place'), the genitive noun, *patriarh-a* 'of patriarch', modifies the first part of a compound, *mest-o* 'place', rather than the whole compound.

Thus, in some languages compounds are morphosyntactically more similar to noun phrases than in others with respect to the possibilities for coreferential deletion and external modification of their components.

5.1.4   (IV)Semantic criteria

Compounds may be paraphrased with phrases using the same lexemes; and their meaning can be described as a sum of the meanings of their parts. These compounds are called semantically compositional, e.g. English *fund-raise*. Others are not – cf. the non-compositionality of English *hogwash*, or Estonian *abi-elu* (help-life) 'marriage' and *vana-ema* (old-mother) 'grandmother', Modern Hebrew *gan yeladim* 'kindergarten', or *balšan* (master+language) 'linguist' (see Sandmann (1988:132–3) for a similar approach to Portuguese compounds). Idiomaticity of the meaning of the entire unit can be used as a semantic criterion for compounds, as it is for verb–object compounds in Mandarin Chinese (C. Li and Thompson (1981:73)), e.g. *shāng-fēng* (hurt-wind) 'catch cold'.

Another problem is distinguishing compounds from non-compounds. Independent lexical items often come from fused and lexicalized compounds; their structure as compounds becomes obscured (see section 8.2). One of the difficulties is determining the status of a form as a part of a compound, or as a bound morpheme (see section 6.2, for some examples from German). Combining forms (also called 'combinemes' by Kirkness (1994)) are a case in point. They are defined as a form of a word or a form related to a word used only as an element in compounds. Typical examples are English *graph* or *log* in *graph-o-logy* or *calli-graphy*. Some are problematic as to whether they are better analysed as roots or as affixes, e.g. *bio-* or *anthropo-*. Unlike affixes, however, many are capable of combining with each other with no 'real' root, yielding formations like *homo-phile*, *homo-phobe*, or *bio-crat* (L. Bauer (1983:214)).[8]

5.2   Nominal compounds

Nominal compounds often consist of free forms, e.g. English *truck-driver*, Modern Hebrew *migdal-or* (tower-light) 'lighthouse'. Or they can consist of a free form and another form, which used to be free. The first part of names for some berries in English – such as *rasp-berry*, *huckle-berry*, *boysen-berry*, *lingon-berry* – used to be a lexical item; in the present-day language only the last part and the whole expression are.

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[8]   This is the main reason for distinguishing Final Combining forms (like *-crat*) and Initial Combining forms (as *bio-*). See Lehrer (1995: 135ff) and Bauer (1983: 214–216) for further arguments in favour of distinguishing compounding forms as a special subclass distinct from prefixes or suffixes in English.

Nominal compounds can contain special forms of free morphemes. In Estonian, nouns can appear in a shortened form in compounds – e.g. *kuningas* 'king', *kuning-riik* (king-realm) 'kingdom' – or take a special form which does not appear anywhere else – e.g. *sepp* 'smith', *sepi-koda* 'smith's workshop'.

A case-marked form may also be used in compounding, e.g. Sanskrit *dhanaṁ-jaya-* (richness:ACC.SG-win-) 'the one who gets riches' (Zalizniak (1978):876)). In Estonian, the nominative and genitive case are commonly used as the first component of a compound, as in *mägi-raud-tee* (mountain:NOM.SG-iron:NOM.SG-way) 'mountain railroad' and *taeva-minek* (heaven:GENIT.SG-going) 'ascension' (Tauli (1973):175–6)). Other cases, such as elative 'from' or allative 'toward', also occur, e.g. *pea-st-arvutus* (head-EL.SG-counting) 'mental arithmetic' and *mehe-le-minek* (man:GENIT-ALL.SG-going) 'getting married' (of a woman).

Nominal compounds can contain members of closed classes, e.g. English *he-man* 'a manly, macho man'. Its morphological properties show that this is a compound (that is, a morphological whole) and not a noun phrase: the plural form is *he-men* (cf. *sports-man*, *sports-men*), and not **they-men*.

Reflexive pronouns often appear as members of nominal compounds, e.g. English *self-service*; Estonian *ise-seisvus* (self-standing) 'independence', *oma-kaitse* (own-defence) 'self-defence' (also a name for a part of the anti-Soviet troops during the Second World War); Russian *sebja-ljubie* (self:GENIT-love) 'selfishness, selflove'; and Sanskrit *sva-karman* 'own deed; debt, duty' (Kochergina (1978):761)). Deictic pronouns can sometimes enter into compounds; examples include Russian *sej-chas* (this:NOM/ACC.SG.MASC-hour:NOM/ACC.SG.MASC) 'now', *sego-dnja* (this:GENIT.SG.MASC-day:GENIT.SG.MASC) 'today'. First and second person pronouns can occasionally enter into compounds, e.g. Estonian *mina-vorm* (I-form) 'a form of a novel written in first person' and *sina-sõprus* (thou-friendship) 'friendship in which people say "thou" to one another'.

Compounds can be formed on phrases, e.g. English *forget-me-not*, or a *what-I-don't-know-won't-hurt-me attitude* (Toman (1992):286)); or French *un je-ne-sais-quoi* 'something' (lit.: 'I don't know what'), (slang) *je-m' en-foutard* 'someone who doesn't care' (lit.: 'I-don't-care-er'); Portuguese *tomara-que-cáia* (may it fall) 'a type of camisole without shoulder straps'; German *Stell-dich-ein* (stand-you.ACC-in) 'rendez-vous' (Motsch (1994):5022)). Compounds may be recursive, e.g. Estonian *vana-vana-vana-ema* (old-old-old-mother) 'great-great-grand-mother'.

Nouns which are involved in compounding are usually non-referential. This is why personal names are rarely used in compounding, or, if they are, they have a non-referential meaning, e.g. Estonian *Antsu-nimeline* (Ants:GENIT-named) 'someone named Ants'. Personal names are occasionally found in names for plants, e.g. Russian *ivan-da-marja* 'a type of flower' (lit.: 'John and Mary').

Further parameters of cross-linguistic variation in compounding include the productivity of compounds of different types, the sources of compounds, and the position of the head (if any). In Germanic, Slavic and Finno-Ugric languages the head usually follows the modifier – e.g. Estonian *pea-linn* (head-city) 'capital', *vana-linn* (old-town) 'downtown, old town', cf. German *Haupt-stadt* (head-town) 'capital' – while in Romance languages the modifier can follow the head, as in Italian *caffelatte* 'type of coffee', or precede it, e.g. Portuguese *boa-vida* (good-life) 'a bonvivant' (cf. noun phrase *vida boa* (lit.: 'life good') 'good life'). In Tagalog nominal compounds, the head typically precedes the modifier, thus creating the reverse order to that in their English counterparts (Schachter and Otanes (1972:110)), e.g. *puno-ng-mangga* (tree-LINKER-mango) 'mango-tree', *tubig-ulan* (water-rain) 'rainwater'.

Traditional classification of compounds operates with two sets of parameters: (I) whether a compound denotes a subclass of items described by one of its elements or not (*endocentric* vs *exocentric*), and whether it is a coordinate structure; and (II) whether it contains a verbal root or not (*root compounds* vs *synthetic compounds*).

5.2.1   (*1*)Endocentric, exocentric and coordinate compounds

Endocentric compounds denote a subclass of items referred to by one of their elements (L. Bauer (1988:35)); this element can be treated as the *head* of the compound. For instance, Estonian *vana-linn* 'old town, downtown' is a kind of town, English *boathouse* is a kind of house, and Tagalog *isip-lamok* (mind-mosquito) 'weak mind' is a sort of mind.

The semantic relationship between the components of endocentric compounds can be of a genitive or part-whole type, e.g. English *soap-dish* 'dish for soap', Russian *masl-o-zavod* (butter-LINKER-factory) 'butter factory', Estonian *sõja-vägi* (war:GENIT-force) 'military force, army' (lit.: 'force of war'), Sanskrit *jīva-loká-* (alive-world) 'world of alive people'. Or one component may modify the other, e.g. English *blackbird*, Russian *bel-o-emigrant* (white-LINKER-emigrant) 'white emigrant', *carj-devica* (king-girl) 'a heavenly (outstanding) girl', Estonian *sini-lind* (blue-bird) 'bluebird', Sanskrit *mahā-rāja-* (big-king) 'great king'. A subtype of the former is the combination of a cardinal numeral plus a noun, cf. English *thrupence* 'three pence', Russian *tridni* 'three days' (both archaic) or Sanskrit *tri-vedī* 'three vedas'.

Exocentric compounds denote something which is different from either of their components. Portuguese *quebra-cabeça*, literally 'break head', refers to a puzzle, or a crossword, and not to a kind of breaking, or a kind of head. Similarly, English *egghead* 'a type of intellectual', *Snow White* (the name of a girl in a fairy story) or its Estonian translation *Lume-valge* cannot be reduced to any one of their components.

The Sanskrit term *bahuvrīhi* (lit.: 'the one who has a lot of rice') is used to refer to exocentric compounds which refer to a person, or an object, with a quality described by a compound; thus *Snow White* is someone who is white as snow, and English *birdbrain* 'stupid person' is someone who (metaphorically) has a brain no bigger than that of a bird (see Marchand (1969:13–14)).

Coordinate compounds (known by the Sanskrit term *dvandva* (lit.: 'two and two') consist of two juxtaposed nouns which refer to a unitary concept, e.g. Bengali *chele-mee* (boy-girl) 'children', Sanskrit *mātā-pitarau* (mother-father) 'parents', Russian *hleb-solj* (bread-salt) 'traditional Russian hospitality'; they can be considered a kind of exocentric compound since their meanings equal that of neither component.

Coordinate compounds may involve synonyms, e.g. Bengali *lok-jɔn* (person/people-person) 'people'. In Mandarin Chinese, compounds of antonyms are used to refer to a unitary concept, e.g. Mandarin Chinese *cháng-duān* (long-short) 'length' or *dà-xiǎo* (big-small) 'size'. They often involve names for several aspects or parts of the same object or event denoted by the compound, e.g. Korean *aph-twi* (front-rear) 'front and rear', *ma-so* (horse-cow) 'horses and cattle' (Sohn (1994:416)), Russian *jugo-vostok* 'Southeast', Portuguese *sud-este*, English *Southeast*. The latter type is frequently used with colour and taste terms, e.g. Russian *sero-zelenyj* 'grey-green', Estonian *magus-hapu* 'sour-sweet'.

The range of semantic relations between parts of compounds is very broad; it often involves description or purpose (e.g. English *party dress* 'a dress to wear to a party', Tagalog *mesa-ng-sulatan* (table-LINKER-writing.place) 'writing table'), or possessive relations (e.g. Tagalog *tinta-ng-Intsik* (ink-LINKER-Chinese) 'Chinese ink'). There are also generic–specific compounds, e.g. Dâw (Makú) *dâw tog* (human-daughter) 'girl'; *dâwʉ́m (*NCL:HUMAN eye) 'a human eye' (Martins (1994:51)). Compounds may get lexicalized in such a way that they become difficult to analyse – see the witty discussion by Matthews (1991:92) of how some compounds in English are impossible to classify along these lines. In the case of *yellowhammer* it is not at all clear whether it 'denotes a finch which resembles a yellow hammer, or . . . it has a head which is like one'. This distinction is usually obscured for compounds with highly non-compositional meaning, e.g. Estonian *vana-ema* (old-mother) 'grandmother' – who is neither a type of mother, nor someone who 'belongs' to a class of old mothers.

5.2.2   (II)*Root compounds and synthetic compounds*

Root compounds – exemplified in (I) – are compounds which do not have a verb base (Roeper and Siegel (1978); L. Bauer (1983:164)). *Synthetic* compounds consist of a verbal root with its argument, e.g. Portuguese *lava-louça*

'dish-washer', English *dish-washer*, Russian *posudomoika* 'someone who washes dishes'. They overlap with lexical compounding (type 1) (section 6.2).

The typical constituent in synthetic compounding is a direct object, e.g. English *watch-maker*, Estonian *kiirus-e-võitja* (speed-GENIT-take:AGENTIVE) 'speedometer'. Oblique constituents which can be compounded include locatives, e.g. Russian *dom-o-sed* (house-LINKER-sitter) 'the one who likes staying at home', or instruments, e.g. *par-o-hod* (steam-LINKER-going) 'steamboat'.

An intransitive subject can get compounded, e.g. Russian *led-o-hod* (ice-LINKER-going) 'ice movement' and *sneg-o-pad* (snow-LINKER-falling), English *snow-fall*, Korean *nwunmwul-cita* (tears-fall) 'shed bitter tears' and *pich-nata* (light-come.out) 'shine' (Sohn (1994):423)). A transitive subject can hardly ever get compounded (cf. a similar restriction on the incorporability of transitive subjects discussed in section 3.3).

An adverb can also be compounded, e.g. Russian *vezde-hod* (everywhere-going) 'a type of large truck'.

5.3   *Verbal compounds*

Verbal compounds, also known as root serialization (or contiguous incorporating verb sequences: Durie (1995)), are sequences of verb roots which result in the creation of a single verb with shared arguments. They are similar to serial verb constructions (see Durie (1997); Aikhenvald (1999b)) in that they (i) refer to a single event; (ii) function in the same way as other clauses – whose predicate consists of just one verb – in discourse; (iii) have a single subject; (iv) may share other arguments; and (v) cannot have independent tense/aspect, modality and polarity values.

Verbal compounds are widespread in head-marking languages (see Nichols (1986)) and in languages which are of neither head- nor dependent-marking type, while nominal compounds are found in most languages independently of their typological properties. Verb compounding is only rarely found in non-head-marking languages. English *stir-fry* is among the few verbal compounds in this language.

In languages which combine serial verbs and verb compounding, the main difference between the two is that serial verbs consist of several independent grammatical and phonological words while verbal compounds form one grammatical and one phonological word. Verbal compounds are more prone to lexicalization and grammaticalization (see section 8.1) than serial verbs. Examples (49) and (50), from Alamblak, a Papuan language from the Sepik Hill family, with the same forms, illustrate the difference between a serial verb in (49) and a lexicalized verbal compound in (50). In (49) the meaning of the whole is easily derived from that of the components. In (50) it is not; the verbal compound is here a lexical idiom (Bruce (1984):163):

(49)   hohra-t   <u>kak-yirona-më-t-t</u>
        thorn-3SG.F   get-feel.pain-R.PAST-3SG.F-3SG.F
        'She got/held the thorn and felt pain'

(50)   <u>kak-yirona-më-t</u>
        <u>get-feel.pain-R.PAST-3SG.F</u>
        'She had birth pangs'

Verb compounding can be used to convey the same meanings as serial verbs (see Givón (1991); see discussion in Aikhenvald (1999b)). Example (51), from Igbo (Lord (1977:151)), illustrates a compound of two roots with a directional meaning (carry-go.home). This compound is not considered a serial verb because the two components form one grammatical word.

(51)   ó   bú-lá   ìtè
        he carry-go.home   pot
        'He carried the pot home'

A verbal compound from Mandarin Chinese with a directional meaning, consisting of three verbs, is illustrated in (52) (C. Li and Thompson (1981:58)).

(52)   tāmen pão-chū-lái   le
        they   run-exit-come   PFV
        'They came running out'

Verbal compounds can be used for such meanings as 'begin' and 'finish', e.g. Mandarin Chinese *chàng-wàn* (sing-finish) 'finish singing', as well as for a number of aspectual meanings, such as accomplishment, e.g. *kàn-dào* (see-arrive) 'succeed in seeing', *xǐə-haõ* (write-complete.task) 'complete the task of writing' (C. Li and Thompson (1981:65, 66)).

Example (53), from Alamblak (Papuan; Bruce (1988:29)), illustrates a compound with a sequential meaning, and (54), from Igbo, shows a cause–effect type (Lord (1977:152)).

(53)   mɨyt ritm   muh-hambray-an-m
        tree insects climb-search.for-1SG-3PL
        'I climbed the tree to get insects'

(54)   ó   tí-gbú   nwóké
        he hit-kill   man
        'He beat the man to death'

A compound can have a goal–benefactive meaning, e.g. (55) from Alamblak (Bruce (1988:39)):

(55)   na yawyt yimam wikna-ha-më-an-m
         I   dog   people buy-give-R.PAST-1SG-3PL
         'I bought the dog for the people' or 'I bought the dog and gave it to
         the people'

Some resultative verbal compounds in Mandarin Chinese (C. Li and Thompson (1981:54ff.)) consist of two elements, where the second one signals the result of the first one; they often describe the state of the object, e.g. *dǎ-pò* (hit-broken) 'break', *mǎi-dào* (buy-arrive) 'manage to buy'.

One of the components of a compound verb can describe the other one, like an adverb, e.g. Tariana (Arawak) *mačá-hui* (be.proper-be.tasty) 'be really tasty', *mačá-puhwi* (be.proper-be.happy) 'be really happy' (see Crowley (1987) and Aikhenvald (1999b) on similar structures in 'ambient' serialization).

'Parallel' verbal compounds are similar to the nominal coordinate compounds. In Mandarin Chinese they are composed of two synonyms, e.g. *mēi-lì* (be.beautiful-be.beautiful) 'be beautiful', or verbs which are almost synonyms, e.g. *tòng-kǔ* (be.painful-be.bitter) 'be painful and bitter', *zhēn-què* (be.real-be.certain) 'be authentic' (C. Li and Thompson (1981):69)).

Languages can have restrictions on verb compounding. In Mandarin Chinese, most parallel verbal compounds contain 'adjectival' verb roots, while in Tariana the only verb root used in compounding is *mača* 'be proper, good'. Compounds may involve a closed class of verbs; for instance, in Chukchi a closed class of motion verbs can get compounded with any number of an open class of verbs, e.g. *ekwet* 'go away' as in *kytgynt-akwat* (run-go.away) 'run away', *racwyñ-akwat* (race-go.away) 'go off to race'; *gt* 'go to' as in *r'ela-gt* (gallop.to-go.to) 'gallop to', *myñe-gt* (dance-go.to) 'go to dances' (Dunn (1999)).

5.4   *Compounding in other word classes*

Compound adjectives are common in languages where adjectives constitute an open class. Adjectives enter into almost any of the kinds of compound structure outlined above for nouns if they are grammatically similar to nouns; if they are more like verbs, they form compounds similar to verbal compounds (see above, on adjectival verbs in compounds in Mandarin Chinese). Compounded adjectives often involve comparison, e.g. English *icy-cold* 'cold as ice', Estonian *haud-vaikne* (grave-silent) 'silent as a grave', *meie-taoline* (we-having.the.image.of) 'such as we'. Russian has numerous coordinate compound adjectives referring to tinges of colour, e.g. *sero-goluboj* 'grey-blue'.

Compound adverbs occur in languages with a separate class of adverbs, e.g. Estonian *ümber-ringi* (around-round) 'all around', *koha-peal* (spot:GENIT-on) 'on the spot' (Tauli (1973):192)), Korean *i-le-na-ce-le-na* (this-way-or-that-way-or) 'anyhow', *cham-ulo* (truth-with) 'indeed, truly' (Sohn (1994):428–30)).

Compound numerals are very widespread, e.g. English *twenty-one*. This is a technique languages have for making the class of numerals virtually open.

Compounding in adpositions and pronouns results in extending a closed class. Compound adpositions are frequently used in European languages to refer to complex spatial meanings, e.g. English *from under*, *down below*, Russian *iz-pod* 'from under' (cf. discussion in Moravcsik (1995:455)), Modern Hebrew *me-'al* (from-on) 'from top of', *me-'ecel* (from-at) 'from at'.

Compound pronouns are not very common; however they do exist. In numerous pidgins and creoles the first person inclusive pronoun is a compound, e.g. Tok Pisin *yu-mi* (you-me) '1st inclusive'. Compound interrogatives (also used as relative pronouns and subordinators) are found in Estonian *kus-juures* (where-at:LOC) 'while, at which', *kus-kohal* (where-place:ALL) 'where', cf. Hungarian *hány-szor* (how.many-time) 'how many times?'.

Compound indefinite pronouns are frequent (Haspelmath (1996:179–82)), e.g. Russian *kto-nibudj* 'anybody', 'somebody', English *any-body*, *some-body*, Modern Hebrew *mi-še-hu* (who-REL-he) 'somebody'.

No other word classes have been found to have compounding.

6   Derivation

Derivation is characteristic of synthetic languages. Derivational processes have to be distinguished from inflectional ones (section 6.1). Derivation applies to different units such as roots, stems and affixes (section 6.2). Functional and formal types of derivational devices are dealt with in section 6.3.

6.1   *Inflection and derivation*

Derivational morphology results in the creation of a new word with a new meaning. In contrast, inflectional morphology involves an obligatory grammatical specification characteristic of a particular word class, as, for instance, marking of syntactic function of a nominal in a phrase or a clause (see Beard (1998:44)).

Prototypical properties of inflectional and derivational processes are summarized in table 1.4 (D. L. Payne (1990:154); S. R. Anderson (1992:218–20; L. Bauer (1983:29)). Typically cited inflectional categories are those which involve agreement within a phrase or on clausal level (see S. R. Anderson (1992), on head–modifier and predicate argument agreement), i.e. gender (or noun class) and number agreement, case, and verbal categories such as aspect and tense (see Bickel and Nichols, in chapter 3 this volume). Typical derivational categories are diminutives and augmentatives, nominalizations of verbs (see Comrie and Thompson, in chapter 6 of this volume) and verbalizations of nouns.

Table 1.4 *Inflection and derivation*

Inflection	Derivation
1. usually obligatory	optional
2. final process (if affix, on rim of word)	pre-final process (if affix, between root and inflection)
3. forms a complete word	derives a stem which takes inflections
4. defining characteristic of a word class (e.g. nouns inflect for case)	usually specific to a word class
5. does not change word class	either derives a stem of a different word class, or adds some semantic specification to a root without changing class
6. may indicate grammatical relationship between words, and/or participate in agreement	never indicates grammatical relationship between words or participates in agreement
7. usually does not show gaps in the paradigm	often shows gaps in the paradigm
8. generally semantically regular	often semantically irregular
9. tends to form smallish systems	may be large systems
10. tends to have high frequency	likely to have lower frequency
11. tends to be monosyllabic	may be monosyllabic or longer

Inflectional categories are typically highly regular and predictable, in both form and meaning. Derivational categories, on the contrary, are often idiosyncratic; derivations often have to be listed in a lexicon, and the derivational history of each word may have to be described separately.

The English prefix *en-* is a good example of a morpheme which exhibits most derivational properties. It can change grammatical class if used to derive verbs from nouns. Its meaning is not quite predictable. With adjectives it means 'provide with a quality of', as in *en-rich* or *en-able*. When used with nouns it usually means 'enter into' or 'put into', as in *en-train*, *en-cage* or *en-chain*. Its meaning may be partly unpredictable, as in *en-tangle* or *en-rol*. It is also used to derive prefixed verbs; in this case it does not change grammatical class, e.g. *en-wrap* (see further examples in Marchand (1969:162–4)).

Languages differ with respect to the applicability of the notions of inflection and derivation. In languages where most grammatical specification is optional it is difficult to draw the line between inflection and derivation.

None of the properties in Table 1.4 is defining by itself; exceptions can easily be found to any of them.

Derivational suffixes sometimes follow inflectional ones, instead of preceding them (contradicting 2 in table 1.4). Turkish has a suffix *-ki* 'belonging to' which arguably changes word class, therefore counting as derivational, yet it can also occur after case markers, e.g. *ev-de* (house-LOC) 'in the house', *ev-de-ki* 'the

one in the house'. To this latter form, plural and case markers may be added, e.g. *ev-de-ki-ler-i* (house-LOC-ki-PL-ACC) 'the ones (accusative) in the house'.[9]

Nominalizations are regular in many languages and do not allow gaps in paradigms, e.g. deverbal action nominalizations in Hebrew, in Northeast Caucasian languages, in Turkish and in Arabic, deverbal nominalizations with *-mine* in Estonian and with *-minen* in Finnish, or *-ing* in English. Other category-changing (see below) derivational processes can also be highly regular, as is the formation of English adjectives with *-able* from transitive verbs, e.g. *readable*, *understandable* (see L. Bauer (1983:28)).

In contrast, number, case and gender – even when considered inflectional – may show gaps in their formation. In Modern Hebrew only a few nouns have dual number (e.g. *šana* 'year', *šnatayim* 'two years'; *yad* 'hand', *yadayim* 'two hands'). Similarly, only a few locational nouns allow the formation of directional case (e.g. *šamaim* 'sky', *šamaim-a* 'to the sky'). In Estonian, some locative cases (Mürk (1990)) can only be used on a limited set of nouns (see section 8.2). Gender agreement in Ayacucho Quechua is restricted to only a few nouns with human referents and to a few adjectives borrowed from Spanish, e.g. *loko maqta* (crazy:MASC boy), *loka sipas* (crazy:FEM girl) (G. J. Parker (1969:34–5)).

The same set of morphemes may combine inflectional and derivational functions, that is, participate in agreement and also be used to form new words. Jespersen (1924a:42) cites the example of French, where the doubling of *n* and the addition of *e* give rise to different gender agreement forms in such adjectives as *bon* (good:MASC) and *bonne* (good:FEM). In the case of *paysan* 'he-peasant' and *paysanne* 'she-peasant' the same technique gives rise to derivation. Similarly, in Portuguese, gender is used to mark agreement – e.g. *agua branc-a* (water:FEM white-FEM.SG) 'white water' – and is also used as a derivational device, e.g. *professor* (teacher:MASC.SG) 'he-teacher' – *professor-a* (teacher-FEM.SG) 'she-teacher'; *ministro* 'he-minister' – *ministr-a* 'she-minister'. See also Mufwene (1980:248–9) on the ambiguous status of Bantu noun class prefixes as inflectional agreement markers and as derivational devices, and N. Evans (1997), for a similar situation in Australian languages; further discussion is in Aikhenvald (1994, 2000) and D. L. Payne (1990:ch. 5).

The status of each particular category in a language as inflectional or derivational should be established on language-internal criteria. What is inflectional in one language can be derivational in another. The category of number is clearly inflectional in most Indo-European languages, with obligatory number agreement within noun phrases and on the predicate. However, in numerous

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[9] Similarly, in Khalkha Mongolian *gər-tə-xi* (house-LOC-ADJ) 'domestic, belonging to the house', an inflectional morpheme marking locative case precedes the derivational, category-changing *-xi*, thus treating the case-inflected form as 'derivational' material. (See S. R. Anderson (1992:127), on how this can be reanalysed to fit in with the claim that inflectional affixes have to follow derivational ones.)

Australian, South American, Cushitic and Papuan languages plural is option-
ally marked within a noun phrase and is better considered as a part of derivational
morphology, as in Guugu Yimidhirr (Haviland (1979:55)) and Hua (Haiman
(1998:545)). While in Indo-European, Northeast Caucasian and Uralic lan-
guages all the cases are considered inflectional, in Warumungu (Australian)
some case suffixes are better considered derivational since they can create new
words (Simpson (1998:724–5)).

These (and numerous other) examples indicate that the distinction between
inflection and derivation can be best represented in terms of prototypes and
extensions from them (see D. L. Payne (1990:154–8)).

Means other than affixation can be used to derive 'new' lexical entries, but
this does not automatically make them into derivational devices. In classifier
languages of analytic profile, classifiers can be used functionally like deriva-
tional devices, to change the meaning of a noun, e.g. Minangkabau (West-
ern Austronesian; Marnita (1996)) *batang limau* (NCL:TREE lemon) 'a lemon
tree', *bungo limau* (NCL:FLOWER lemon) 'a lemon flower' (cf. examples from
Burmese in table 1.2). The distinction between alienably and inalienably pos-
sessed nouns can be used to differentiate distinct meanings. In Tariana (Arawak),
the same lexeme means 'breath, heart' when inalienably possessed (*nu-kare* 'my
breath, my heart'), and 'wind' (*kare*) when alienably possessed.

The continuum-type relationship between inflection and derivation can be
further illustrated with examples from the historical development of derivational
and inflectional morphology. An inflectional morpheme can develop into a
derivational one and then into an inflectional one again. According to Matthews
(1991:53), the Proto-Indo-European suffix **sk* was used to form inchoative from
present tense and must be considered inflectional. In Latin, the cognate form *-sc-*
appears in a few verbs, e.g. *cognosco*, and is used to form new verbal lexemes
having lost its regularity and productivity. In modern Italian, the cognate form
-sc- appears as a part of the conjugation of a subclass of verbs, having become
inflectional again.

6.2   *Roots, stems and affixes*

Derivation[10] operates with different kinds of morphemes. Bound morphemes
are usually classified into roots and affixes.[11] Roots convey lexical meaning and
affixes provide additional specification. A root is traditionally defined as a part
of a word which remains after inflectional and derivational affixes are removed.
The distinction between affixes and roots is usually justified by the fact that

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[10] There are several views on the nature of derivation (see Beard (1998:46–7); Matthews (1991);
Bybee (1985)).

[11] See Haspelmath (1992), Beard (1998), on the possibility of considering affixes as heads within
a derivation.

affixes can generally be exhaustively listed while roots constitute an open class (Bloomfield (1933:240)).

Roots can have different structure. In familiar Indo-European languages roots are *continuous*, e.g. English *man*, *boy*. Semitic languages have *discontinuous* consonantal roots which combine with different vocalic infixes – which may go with prefixes or suffixes – to create words, cf. Egyptian Arabic *k-t-b* 'write' in *kataba* 'he wrote', *ka:tib* 'writing (person)', *kita:b* 'book', *ma-ka:tib* 'place for writing'.

Synthetic and especially fusional languages tend to have *stems* which are different from *roots*. *Stem* (or *base*) is a bound form to be combined with derivational affixes (for a discussion of the term *stem* and the limits of its applicability, see Aronoff (1992a)). Different derivational affixes may select different stems. In Estonian some deverbal nominalizations are derived from the past tense and infinitive stem, e.g. *lugema* 'read' (infinitive), *luge-mine* 'reading', *luge-ja* 'reader', while others apply to the present stem, e.g. *loe-ng* 'lecture', *loe-tav* 'readable' (*loe-n* 'I read'). That is, one root gets represented through a number of stems. Some denominal derivational affixes require a nominative stem, as in Estonian, *sõd-ur* 'warrior' from *sõda* 'war' (genitive *sõja*), and others require a genitive stem, e.g. *sõja-kas* 'belligerent'. Synchronically, the choice of a stem often has to be given in a dictionary as a kind of lexical specification for a given affix. Similarly, in Modern Hebrew the feminine form of *kelev* 'dog', *kalba* 'she-dog', is derived from the stem *kalb-*, and the reduplicated diminutive is derived from the stem *klav*, e.g. *klavlav* 'a cute little dog'. A stem and a root may coincide, as in German derivation from a verb like *lach-en* 'laugh' where the bound form *lach-* is used for derivation, e.g. *Lach-en* 'laughing', *Ge-läch-ter* 'laughter', *lach-haft* 'laughable', *Lach-krampf* 'laughing spasm'.

The meaning of a stem when used as a free form may differ from its meaning within a derivation. This is often related to the semantic development of a stem; for instance, *meat* means 'edible flesh' when used independently; but in compounds like *mince-meat tart* it retains its archaic meaning referring to non-flesh food. Similarly, Russian *sol'* means 'salt' when used independently; however, in a derivation like *sol-ënyj* (*ogurec*) 'pickled (lit.: "salted") (cucumber)' the root has the meaning 'pickled'.

Derivational processes can apply to units bigger than a stem. They may apply to whole noun phrases, especially fixed expressions, e.g. suffix *-an* in [*South Australia*]-*an* and *-ery* in [*fish and chip*]-*ery* (the name of an establishment in Melbourne; note the absence of *-s* on *chips*). In Hungarian, the adjectivizer *-i* can be used to derive adjectives from nouns (e.g. *ország* 'country', *ország-i* 'belonging to a country') and from NPs consisting of noun+postposition, e.g. *ébed útan* (dinner after) 'after dinner', *ébed útan-i* 'belonging to after dinner' (e.g. after-dinner mints) (Kenesei, Vago, and Fenyvesi (1998)).

Derivational processes can operate on formatives shorter than the stem, e.g. English *croissan-wich* (from *sand-wich*), *dognapping* (based on *kidnapping*), or *mugg-accino* (based on *capuccino* and *mug*) (see section 6.3.2 on clippings and blends).

A derivational affix may be hard to distinguish from a part of a compound. In German *-schaft* is widely used in the formation of abstract nouns, e.g. *Freund* 'friend', *Freundschaft* 'friendship', *Geselle* 'fellow', *Gesellschaft* 'company'; there is also a noun *Schaft* 'shaft'. Similarly, *-weise* 'in the manner of' (cf. *-wise* in English) freely combines with nouns, as in *ausnahmsweise* 'by way of exception' (*Ausnahme* 'exception'), *bedauerlicherweise* 'regrettably' (*bedauerlich* 'regrettable'), just like English *-like* in *carrot-like*. There is also a free noun *Weise* 'way, manner, fashion'. What we have here is a process whereby a compounded noun is becoming grammaticalized as a suffix. This grammaticalization is not yet complete, since the link between the compounded form and an independent noun is rather transparent.

6.3   *Types of derivational processes*

Functionally, derivational devices can change word class (be category-changing) or be word-class-specific (see section 6.3.1). Formally, they are prefixes, suffixes, circumfixes and so on – see section 6.3.2.

Derivational processes can be classified according to further, language-specific parameters. They may apply recursively, e.g. recursive prefixing in *meta-meta-language*, *re-re-write*, while others may not. Some derivational affixes can stack, e.g. English prefixes as in *anti-counter-revolutionary* (Lehrer (1995)); others cannot. Some affixes allow change of ordering, with different semantic effect, e.g. German *un-be-ruhigt* 'disquietened' versus *be-un-ruhigt* 'disturbed'.

Derivations may also be classified by their etymology. Neo-classical combinations, such as *bibliophile* or *xenophobia* in English, are considered a special type of word formation (Kirkness (1994)).

6.3.1   *Functional classification of derivational devices*
Category-changing derivational processes involve change in word class, providing a criterion for distinguishing word classes within a particular language. The most frequent types of category-changing morphology involve changes from one major open class to another (i.e. noun ↔ verb, adjective ↔ noun, adjective ↔ verb). Adverbs can also be derived from nouns, adjectives or verbs. Deverbal nominalizations are a typical example of word-class-changing morphology – see some examples in section 6.1.

In languages with clearcut classes of nouns, adjectives and verbs, category-changing derivations are common. For instance, in Boumaa Fijian (Dixon

(1988:43, 195)), where adjectives are a separate open class, there is a verbal prefix which derives adjectives: *dau-* 'habitually, often', e.g. *qito* 'play a game', *dau-.qito* 'habitually playing games'. In languages in which adjectives are similar to nouns in their properties, both adjectives and nouns are likely to be verbalized. In Watjarri (Australian; Douglas (1981:221)) the same operations are used to derive transitive and intransitive verbs from nouns and from adjectives. In a few languages of this type, adjectives, but not nouns, can be verbalized.

In languages in which adjectives are similar to verbs, if a verb can be nominalized, so can an adjective. For instance, in Longgu (Oceanic; Hill (1992)), adjectives are an independent closed class of their own which shares numerous properties with verbs; similarly to verbs, adjectives have to be nominalized to be used as heads in possessive noun phrases.

Derivational devices of all sorts typically apply to open lexical word classes such as verbs, nouns, adjectives and adverbs (see Schachter and Shopen in vol. I, chapter 1) but only rarely to closed grammatical classes, such as interrogatives or demonstratives. For instance, in Italian, the adverbializing suffix *-mente*, used with most nominals, does not apply to possessives and demonstratives (cf. Scalise 1990:87). Only in a number of European languages can verbs be derived from 1SG and 2PL personal pronouns, to indicate the manner of address, e.g. Estonian *sina-ta-ma* (2SG-DENOM-INFV) versus *teie-ta-ma* (2PL-DENOM-INFV), German *du-zen* (2SG-VBZR) versus *sie-zen* (2PL-VBZR), French *tutoyer* versus *vouvoyer*, Spanish *tutear* versus *vosear*, Russian *tykatj* versus *vykatj* 'say thou' and 'say you (PL) as a mark of respect', respectively.

Derivational processes may involve change from one morphosyntactic subclass of a word class to another. Valency-changing derivations (see Dixon and Aikhenvald (1997)) derive a subclass of verbs within verbs. For instance, causatives typically derive transitive verbs from intransitive, as in Warekena (North Arawak; Aikhenvald (1998)) *biyada* 'escape', *biyuda-ta* 'make escape', *yapa* 'enter', *yapa-ta* 'make enter'. Many languages have special means for deriving a subclass of nouns of location, or of instrument, e.g. *-iya* in Modern Hebrew – *sifriya* (book+LOC) 'library' from *sefer* 'book' – or *-mi* in Tariana (North Arawak) *di-hpani-mi* (3SG.NF-work-LOC) 'the place where he works, work-place' (see Comrie and Thompson, chapter 6 of this volume).

Derived subclasses of nouns may include natives of a particular place, e.g. Boumaa Fijian *'ai: 'ai-Boumaa* 'person from Boumaa' (Dixon (1982):43)). In Ilocano, the infix *-um-* placed before the first vowel of the root derives names of inhabitants, e.g. *ili* 'town', *um-ili* 'inhabitants of the town; citizen', *lugar* (Spanish loan) 'place', *l-um-ugar* 'inhabitants of the place' (Rubino (1997):94)). The prefix *taga-* attached to a name of a geographical location derives origin or nationality, e.g. *taga-Amerika* 'American' (1997:90). Tariana has a derivational

affix *-ari* which derives names of rivers (hydronyms), e.g. *makw-ari* (Makú-AFF:RIVER) 'river of the Makú people'.

A derivational process may change word class, and at the same time be employed to derive subclass within a class. In many languages, a causative marker – which transforms intransitive verbs into transitive (see Comrie and Thompson, chapter 6 of this volume) – 'doubles' as a marker of denominal verbs, e.g. *-ta* in Estonian (*suits* 'smoke' (noun), *suitse-ta-ma* 'to smoke', *põlema* 'burn' (intransitive), *põle-ta-ma* 'burn (something), i.e. make something burn'), or Warekena (Arawak: Aikhenvald (1998)): *punia* 'enemy', *punia-ta* 'make an enemy (of someone)'; *yupita* 'sieve', *yupita-ta* 'sift'; *-mita* 'fly', *-mitata* 'make fly'. In Hebrew, the 'intensive' stem characterized by vowels *i-e* is regularly used to derive transitive verbs from nouns, especially loans, e.g. *tilpen* 'ring up' (based on the consonantal root *t-l-p-n* 'telephone'); it is also a productive way of deriving causatives, e.g. *katav* 'write', *kittev* 'dictate'.

The prefix *va'a-* in Boumaa Fijian is an example of a derivational device with a wide variety of functions (Dixon (1988:44, 181–91)), both category-changing and subclass-changing. It can be prefixed to a greeting or an interjection to derive a verb 'use that greeting or interjection', e.g. *va'a-bula* 'to say *bula* [hello]'. When used on a noun, it derives verbs, e.g. *va'a-.teevoro* 'worship spirits'. When used with a number, it derives an adverb, e.g. *va'a-.rua* 'twice'. With an adjective of value, speed or physical property, it also derives an adverb, e.g. *vina'a* 'good', *va'a-.vina'a* 'well, properly'. But with some adjectives it may derive a transitive verb, as in *bera.bera* 'slow', *va'a-.bera.bera* 'delay, i.e. make slow', and with others an intransitive verb, e.g. *rewa* 'high', *va'a-.rewa* 'be raised (of a flag)'. Finally, *va'a-* also derives causatives of some verbs, e.g. *yali* 'be lost, non visible', *va'a-.yali* 'lose' (p. 187), and verbs with intensive meaning of others, e.g. *rai-ca* 'see', *va'a-.rai-ca* 'watch, inspect, look after'.

Derived members of a word class may differ in their semantic and syntactic properties from underived ones. For instance, in Kobon (Papuan; Davies (1981:42–3)) only derived adjectives can function as nonverbal predicates of a clause, while simple adjectives cannot.

Derivational processes which do not involve change in word class are called *category-preserving*. They may apply to members of several word classes. For instance, the negative prefix *ma-* in the North Arawak languages Baniwa and Tariana is used with verbs, adjectives and nouns. Most temporal prefixes in English (e.g. *pre-* and *post-*) are used with nouns (*pre-school*), adjectives (*pre-Victorian*) and verbs *(pre-register)* (Lehrer (1995)).

Category-defining processes are typical for a particular word class, or a subclass within a word class. Nouns and verbs often have different morphological structure and different derivational possibilities. In some Semitic languages, e.g. Amharic (Ethiosemitic) and Hebrew, prototypical verbs have root-and-pattern morphology ($C_1C_2C_3$) (see section 6.3.2) but prototypical nouns don't

(deverbal nominalizations are exceptions). In Khmer, verbs have fossilized prefixes and infixes, and nouns do not. In Kana (Cross-River, Benue-Congo), nouns only have infixes and prefixes, and verbs can only have suffixes.

Expressives (or ideophones) – or sound-symbolic words – offer examples of unusual category-specific morphology. They often occur reduplicated or repeated, and display unusual correlations with tones in tone languages. In Lao, an isolating language, they are usually reduplicated for emphasis, e.g. *nɔ́ɔn ʔāak-lāak* (lie EXPRESSIVE) 'lie in a tired, lethargic manner'; *pen húu cī̄ŋ-pī̄ŋ* (be hole EXPRESSIVE) 'a really small hole'. In Ewe (Kwa family) they often have an inherently reduplicated or triplicated form; low tone means negative value or large size, and high tone means positive value and small size, e.g. *lilili* 'smell', *ŋaŋaŋaŋa* 'taste' (high tone: sweet; low tone: sour or bad). And in Khmer, expressives display an unusual vowel ablaut (*tooŋ-taaŋ* 'clatteringly'), and consonant alliteration (*prəm-prej* 'cute, likeable'). In morphologically complex synthetic languages – such as Zulu (Bantu), Nivkh (Siberian isolate), Turkic languages, Selkup (Uralic), Apalai (Carib) and Russian – expressives often do not take any affixes at all.

The same derivational device can behave differently with different word classes and thus be category-defining. In Portuguese, the augmentative is widely used with adjectives and with nouns, but its meaning is somewhat different. Augmentatives of adjectives always have augmentative meaning, e.g. *grande* 'big', *grand-ão* 'very big'. In contrast, augmentatives derived from nouns may develop idiosyncratic semantics: for instance, the augmentative of *sapato* 'shoe', *sapatão*, means 'big shoe', and also has an additional meaning of 'lesbian'. Along similar lines, in Kabyle (Berber, Afroasiatic) the circumfix *t- . . . -t* derives the feminine of sex-differentiable nouns and adjectives, e.g. *afunas* 'ox', *t-afunas-t* 'cow', *amellal* 'white (masculine)', *t-amellal-t* 'white (feminine)', and the diminutive with other nouns, e.g. *afus* 'hand', *t-afus-t* 'little hand'.

Reduplication as a derivational device often works differently for different word classes. In many Oceanic languages the semantic effect of reduplication can be considered to be category-defining. Thus, in Longgu, full reduplication is the way of deriving nouns from transitive and intransitive verbs (Hill (1992)), e.g. *kuvi-a* 'cover it', *kuvi-kuvi* 'a cover, blanket'. Adjectives can also be reduplicated, to mark intensity of the quality expressed by the adjective, e.g. *muha* 'happy', *muha-muha* 'very happy'.

As we mentioned above, derivational devices of all sorts hardly ever apply to closed grammatical classes. However, in colloquial Brazilian Portuguese diminutives can attach to demonstratives, e.g. *esse-zinho* (this:MASC- DIM:MASC) 'this tiny one', *aquele-zinho* (that:MASC- DIM:MASC) 'that tiny one' (see section 8). Distal demonstratives are sometimes derived from proximate ones, e.g. Tariana (North Arawak) *ha* 'this', *ha-ne* 'that'.

Synthetic languages have a rich derivational morphology, both category-changing and category-defining, while isolating languages have few derivational devices. If a language has productive non-category-changing morphology, it will also have category-changing morphology. (Isolating languages like Khmer or Vietnamese have just some relics of non-category-changing morphology.) In isolating languages with no morphologically defined word classes there is no, or almost no, category-changing or category-defining morphology. Vietnamese is a typical example. In Vietnamese, nouns differ from verbs in that nouns combine with classifiers and demonstratives; verbs combine with particles expressing tense/aspect/mood; there are restrictions on nouns functioning as predicates (they have to be preceded by a copula *là* or its negative counterpart); verbs have to be accompanied by classifiers to be used as predicate arguments, e.g. *cái* 'thing', *tát* 'to slap', *cái tát* 'a slap', *cái đẹp* 'beauty' (K. L. Adams (1989)). Derivational devices – a few prefixes, suffixes and tonal alternations – are limited to expressives and intensives (L. C. Thompson (1987):150–67)).

More work is needed to work out correlations between the existence of rich derivational morphology and other typological properties of a language. We hypothesize that languages in which there is no one-to-one correlation between a functional slot (i.e. argument, predicate, modifier) and word class do not require class-changing derivations as much as languages in which certain word classes are restricted to certain functional slots.

For instance, in Huallaga Quechua (Weber (1989)), verbs are used only as predicates and nouns and adjectives only as predicate arguments and modifiers; to be used as arguments verbs have to be nominalized, and to be used as predicates nouns and adjectives have to be verbalized. This accounts for the presence of verbalizing and nominalizing derivational morphology in the language. Both nouns and adjectives can be used as arguments and as modifiers; hence there is no need for category-changing devices used to derive modifiers from nouns. In Manambu, a Ndu language from the Papuan region, a member of any open class (noun, adjective, verb) can be used as a predicate or as a modifier; hence, there are no adjectival or verbalizing derivations (the three open classes differ in the amount of inflectional morphology they take). In Boumaa Fijian both nouns and adjectives can be heads of noun phrases (Dixon (1988):238)); this may account for the absence of adjective to noun derivations in this language.

6.3.2   *Formal classification of derivational devices*

Derivational devices fall into *affixes* and *morphological processes*. Affixes can be *continuous* or *discontinuous*. *Continuous* affixes include prefixes (e.g. English *re-*), suffixes (e.g. English *-er*, or *-or*) and infixes (see examples below).

Most languages of the world have more suffixes than prefixes. No language has prefixes without having suffixes. Athabascan, Western Austronesian, a few South American languages (Nadëb, from the Makú family, and Cayuvava, an almost extinct isolate from Bolivia: Key (1967)) and a number of languages from northern Australia are known to have a large number of prefixes and prefix positions; in most other languages prefix positions are limited, while suffix positions offer many more choices. For instance, most Arawak languages of South America have just one prefix position and a small system of prefixes filling it, in contrast to numerous suffix positions and a large number of suffixes. All the Tucano languages are predominantly suffixing, but some also have a couple of prefixes.

Infixes are rather rare, e.g. Khmu (Mon-Khmer) *ska:t* 'rough', *s-m-ka:t* 'roughen' (Mugdan (1994:2549)); Khmer *khoh* 'to be wrong', *k-ɔm-hoh* 'a wrong'; Ilocano (Western Austronesian) *kuton* 'ant', *k-in-uton* 'ant-infested' (Rubino (1997:131)).

Discontinuous affixes include circumfixes – a combination of a prefix and a suffix which have to occur together and 'enclose' the stem, e.g. Kabyle (Berber) diminutive *t-* . . . *-t*, e.g. *ahham* 'house', *t-ahham-t* 'little house' (Vincennes and Dallet (1960):40)).

Semitic languages offer an example of discontinuous morphemes of a different type. While the lexical meaning is carried by the consonantal root, different vowel sequences known as *transfixes* serve to add inflectional and derivational meanings. This is known as root-and-pattern morphology. Transfixation is different from apophony, or sound alternation used as a derivational device (despite Beard (1998:61); cf. Mugdan (1994:2549)) since it is much more regular and all-pervasive. Vowel transfixes can appear by themselves, or combine with a prefix, a suffix, an infix or a circumfix. The following words, from Arabic, are derived from the consonantal root *ʒ m ʔ* 'bring things together' (the consonants of the root are in bold type): *ʒʊ mmaʔ* 'aggregate', *ʒæmaʔæ* 'group of people', *ʔiʒmaʔ* 'unanimity', *ʒʊ mʔæ* 'Friday' (i.e. a day for assembly), *tæʒmiʔ* 'assembly', *mæʒmæʔ* 'place where two things meet', *ʔiʒtimaʔ* 'meeting'. Modern Hebrew root *k/x t b/v* 'write' yields *kotv* 'he writes; the one who writes', *ktiva* 'something that was written, writing', *ktovet* 'address', *mixtav* 'letter'. The Hebrew noun *mi-lxam-a* 'war' is derived from the root *l x m* 'fight' with a circumfix.

Morphological processes used in derivation include *apophony*, *reduplication*, *prosodic modification* and *subtraction*. Rare processes are *conversion*, *repetition* and *metathesis*.

Apophony (also known as *ablaut*) involves replacement or alternation of a certain element of the base, e.g. consonant and vowel alternation in English derivations such as *break* [*breik*] and *breach* [*bri:tʃ*] or vowel change in *admire* [*ədmaiə*] versus *admiration* [*ædməreiʃən*]. Apophony differs from transfixation

in that it involves the variation of a root vowel under certain morphological conditions without there being any regular association between the lexical meaning of the root and the grammatical meaning of the vowel pattern.

Reduplication is very frequently used both as a category-changing and as a category-defining device (see section 6.3.1; for a detailed account of types of reduplication and their semantics see Key (1965)). In Kana (Cross-River, Benue Congo; Ikoro (1996:106–7)) partial reduplication of the first cv of a verbal root (followed by lengthening of the vowel in the reduplicated syllable) is used to derive deverbal nouns, e.g. *dɔ* 'dig', *dɔɔdɔ* 'digging'; *dʒìgē* 'snatch', *dʒī̀dʒìgē* 'snatching'. Full reduplication is used to derive nouns with the meaning of 'too much' (as a category-defining morphological device), e.g. *dànà* 'loan', *dànàdànà* 'excessive loan'.

In languages with distinctive stress, or tone, words can be derived by *prosodic modification*. In English, some object nominalizations are derived just by accent shift, e.g. *ímport – impórt*, *súspect – suspéct*. Tone is used to mark change in word class in Dâw (Makú family; Martins and Martins (1999)), e.g. *wɔ̀:d* (low tone) 'eat', *wɔ́:d* (high tone) 'food'. In Vietnamese, prosodic modification goes together with repetition, to derive intensives, e.g. *xẹp* 'be flattened', *xép-xẹp* 'be completely flattened' (L. C. Thompson (1987:156)).

Subtraction, that is, regular elimination of a part of a root, is rarely used in derivation (despite Beard (1998:61) who maintains that it is not used at all), e.g. *Joe* from *Joseph*. Subtraction is used to form plural derivations in some languages, e.g. Tariana *inaru* 'woman', *ina* 'women', Jarawara (Arawá) *inamatewe* 'child', *matehe* 'children'. *Truncation* is similar to subtraction in that it is a type of word formation whereby a derived word is shorter than the source, e.g. English *nominee* from *nominate*, Hungarian diminutive *Erzsi* from the full name *Erzsébet* 'Elizabeth', colloquial Finnish *tel-ka* (from *televisiooni* + diminutive) 'TV', and Estonian *teler* from *tele(visoo)r* 'TV'.

Conversion is also known as zero-derivation, e.g. English *walk* as verb and as noun (Beard (1998:62)).

Repetition is sometimes used as a derivational device, especially as category-defining morphology for expressives (see section 6.3.1), e.g. Khmer *piim pəəm* 'grope and creep about' can be repeated to give the expression a more continuous feel: *piim pəəm piim pəəm*; cf. also Kurdish *teqe-teq* 'knock-knock', *bōre-bōr* 'mooing of a cow' (Smirnova and Ejubi (1970:387)) (both derived from onomatopoeia). In Quechua repetition of a whole inflected form is used to derive intensives (Weber (1989:324)), e.g. *ni-sha ni-sha* (say-3.PERF say-3.PERF) 'said [people on different occasions]'. *Alliterative repetition* may also be used as a derivational device. In Kurdish (Smirnova and Ejubi (1970:387)) it is used to derive collective nouns, e.g. *tişt-mişt* 'things, belongings' (*tişt* 'thing'), *gŭɫ -u-mŭɫ* 'flowers and other plants' (*gŭɫ* 'flower'), cf. also Tamil *viyāparam-kiyāparam* 'business and such' (from *viyāparam* 'business': Steever

(1988)).[12] Repetition as a marginal device is also found in English, e.g. *heebee-jeebies*, *teeny-weeny*, *higgledy-piggledy* – see further examples in Marchand (1969). English *dilly-dally*, *fiddle-faddle*, *snip-snap*, *zig-zag* (Bloomfield (1933):156)) involve irregular phonological alternations.

Metathesis is almost never used as a derivational process by itself (cf. Beard (1998:61)); it is frequent as an allomorphic change which occurs as the result of affixation, e.g. Hebrew *šamar* 'he preserved', *hištamer* 'he preserved himself' (here the final segment of the reflexive–reciprocal prefix *hit-* obligatorily metathesizes with the initial root sibilant).

Derivational devices distinct from compounding but involving more than one free stem are *acronyms*, *clippings*, *abbreviations* and *blends*.

Acronyms are a frequent source of new words in numerous Indo-European languages, e.g. English *YMCA*, Russian *IVAN* (from *I(nstitut) V(ostokovedenija) A(kademii) N(auk)*) 'Institute of Oriental Studies of the Academy of Sciences', *bomzh* (from *b(ez) o(predelennogo) m(estozhiteljstva)*) 'a person without a definite place to live, homeless', or Portuguese *CNPQ* (C(onselho) N(acional) (de) P(esquisa)) 'National Council for Research'. These are most frequently proper names of institutions. They tend to be read as words only if they conform to the patterns of phonotactics and thus make a readable word. For instance, in English *YMCA* 'Young Men's Christian Association' and *LSA* 'Linguistic Society of America' are read by the names of the letters since they do not conform to the rules of English phonotactics. In contrast, *NASA* 'National Aeronautics and Space Administration', *CASA* 'Civil Aviation Safety Authority' or *HOD* 'Head Of Department' are read as words. Some acronyms, however, are read in an idiosyncratic way: *AAA* 'American Anthropological Association' is known as 'Triple A', and *YWAM* 'Youth With a Mission' is read as 'why-wam': that is, the first letter is read as a letter, and the rest as a separate word.

Clippings are formed on the basis of two words put together; some syllables get truncated, e.g. English *motel* from *motor hotel*, or Russian *zamkom* from *zam(estitelj) kom(andujuschego)* 'deputy commander'.

Abbreviations follow the principles of optimal word structure, e.g. Portuguese *UniCamp*, from *Uni(versidade) (de) Camp(inas)* 'University of Campinas', Modern Hebrew *tapuz* (from *tapu(ah) z(ahav)* 'apple golden') 'orange', or English *Uni Melbourne* for *Melbourne University*.

Somewhat similar to clippings are word *shortenings*, e.g. Australian English *chokky* for *chocolate*, *veggies* for *vegetables*, *presies* for *presents* and *congrats* for *congratulations*, French *hélico* for *hélicoptère* 'helicopter', Estonian (colloquial) *lauba* 'Saturday' (instead of *laupäev*, where the change *p/b* can be accounted for by regular phonological processes in Estonian: Lehiste (1964)).

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[12] Beard (1998:63) says that intonation can be used for derivational purposes; this does not appear to be correct.

Blends are a type of word-formation which involves putting together two or more different morphemes, or their parts (Algeo (1977:49–55)). They are particularly productive in English, but also appear in a few other languages, mostly Indo-European (see Cannon (1986:725)). One of the oldest blends in the history of English is *hathel* 'nobleman' from *Sir Gawain and the Green Knight*, a blend of *athel* 'noble' and *haleth* 'warrior' (Pyles (1971:298)). In Lewis Carroll's *Through the Looking Glass*, Humpty Dumpty coined *chortle* as a blend of *chuckle* and *snort*, and this is now well established in English usage.

Compounds involve putting together two or more forms which could appear by themselves. In contrast, blends are hard to segment. They may involve phonological overlapping of forms, as in *filmania* (< *film* + *mania*) or *slanguage* (from *slang* + *language*).

This can be accompanied by clipping, e.g. *foodoholic* (from *food* + *(al)coholic*), or *brunch* (from *br(eakfast)* + *(l)unch*); Korean *acem* 'brunch' (from *a(chim)* 'breakfast' and *cem(sim)* 'lunch'); Russian *trudo-golik* (worko-(alco)holic) 'workoholic'; Spanish *salchi-papas*, from *salchi(cha)* + *papas* (sausage + fries), a dish which consists of a mixture of sausage and fries; French *briochoco* (from *brioche* + *choco(lat)*) 'a kind of chocolate bun'.

Further examples from non-Indo-European languages include Japanese *rorikon*, the term used to refer to an older man who likes teenage girls, from *loli(ta)* (read as *rori*) + *com(plex)*; Tagalog *tapsilog* 'a type of traditional breakfast', from *tap(a)* 'dried beef' + *si(nangag)* 'fried rice' + *(it)log* 'egg'; Turkish (slang) *gerzek* 'idiot, jerk', from *ger(i)* 'backwards' + *zek(âlî)* 'intellect' = 'mentally retarded', *meysu* 'fruit juice', from *mey(ve)* 'fruit' + *su(yu)* 'water'.

Combining parts which participate in forming blends may involve simple substitution, e.g. *dog-napping* (cf. *kid-napping*), or Colloquial Russian *zrjaplata*, a combination of *zarplata* 'wages' and *zrja* 'in vain', used to refer to wages paid for not doing anything. Similarly, in Japanese, *ryū-gaku* (which consists of two characters: 'stay' and 'study') 'study abroad' is often replaced with a blend *yū-gaku* ('play' + 'study') to refer to someone who pretends to go overseas to study but in fact is going there to have fun.

The boundaries of replaced components do not always coincide with morpheme boundaries, e.g. *smog* (from *sm(oke)* + *(f)og*), *Hungarican* (from *Hungarian* + *(Am)erican*), *vodkatini* (cf. *mar-tini*), *turkeyfurter* (cf. *frankfurter*) (examples from Lehrer (1997)). In Ilocano, *pinakbet* (CAUS:PFV + wrinkle when cooked) is a traditional dish of vegetables mixed with pork meat which are wrinkled when cooked; when this dish comes out too watery it is called *pinakbaw*, via blending with *nalabnaw* 'watery'; and in Tagalog *abogago*, a combination of *abogado* 'lawyer' and *gago* 'stupid', means 'stupid lawyer'.

Orthographical blends are aimed at a visual effect, e.g. *purrfect* with reference to 'perfect' catfood which is supposed to make cats 'purr'; they are widespread in English brand names and advertisements.

Blends are often used for a comic effect in journalistic language. Many of them start their life as ad-hoc formations, and gradually get established, becoming productive combining forms, e.g. *-gate* 'political scandal' (*Irangate*, *Billygate*, based on *Watergate*), or *-teria*, as in *candyteria*, *shoeteria*, *gasateria*, based on *cafeteria* (Lehrer (1997)); Portuguese *-dromo* '-drome' (synchronically reanalysed as *-ódromo*: Sandmann (1991:56)), as in *samb-ódromo* 'place where they dance the Samba during Carnaval' and *Rock-ódromo* 'place for rock-music-show'.

Backformations create new words by employing a productive derivational scheme (see section 7) and subtracting what looks like an affix, e.g. English *sculpt* from *sculptor* or *babysit* from *babysitter*. Backformations may involve *reanalysis*. The Russian word *zont* 'umbrella', a backformation from *zontik*, originally 'umbrella', now 'small umbrella', is another example. The word *zontik* was borrowed into Russian from Dutch *zondek* 'sun-cover' (Vasmer (1953–8)), and then reanalysed as containing a diminutive suffix *-ik*, i.e. *zont +* diminutive, and subsequently reinterpreted as meaning 'small umbrella'. *Zont* then became the 'main' word for 'umbrella' in the language.

7   Productivity and related phenomena in word-formation

Word-formation rules differ in their *productivity*. This correlates with their *regularity* and *predictability*.

A word-formation process is said to be *productive* if it is used synchronically to produce new forms; the fewer restrictions there are, the more productive the process is (L. Bauer (1983:99)). The application of a derivational process often depends on lexical or other properties of individual roots or stems and thus is bound to display certain idiosyncrasies which block its productivity. The distribution of a non-productive process can be accounted for by a list of bases in which it occurs.

The productivity of a process is a continuum; that is, processes should be described as more or less productive rather than as productive or non-productive.[13]

Some category-changing morphological devices have no restrictions whatsoever; for instance, the formation of *-ing* nominalizations in English is permitted on any verbal root. These devices can develop from derivational to inflectional (Panagl (1987)) – see section 8.1.

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[13] This view of productivity as a scalar phenomenon can be contrasted with an absolute interpretation of productivity; according to this view bases and affixes may be subject to various restrictions (discussed below); and, since we do not have an exhaustive list of all the restrictions, any apparent lack of productivity of a process may be due to a restriction which has not been properly stated.

7.1   *Determining productivity*

The productivity of a process of word formation can be determined quantitatively: the more productive processes produce many new words which are frequently used. According to Aronoff (1976:36) the index of productivity of a given process is the ratio of possible to actually attested words. This correlates with the functional load of derivational processes; that is, some appear to derive many more new words than others. The activity of a process can increase or decrease in the history of a language. The patterns of 'strong' inflection from Early English have already stopped being functional parts of grammar (pairs such as *sing*, *sung* or *catch*, *caught*) and probably have now to be listed in the lexicon. In Biblical and Mishnaic Hebrew, most deverbal nouns were derived as identifiable combinations of consonantal root + vocalic infix patterns (traditionally known as *mishkal*: see Aronoff (1994:130–1); Berman (1978)). In Modern Hebrew, the productivity of these combinations can be said to have drastically diminished, due to the influx of loans from Indo-European languages. The previous stages of Khmer had productive affixation as a category-changing device; when affixation lost its productivity, the existing formations became lexicalized.

Recursiveness of a derivational process is an indication of its productivity. For instance, in English the prefix *re-* can be used recursively, e.g. *re-remake*, *re-rewrite*. Compounding can be recursive, as is the case with English *great* as in *great-grandfather*, *great-great-great-grandfather* and its equivalents; cf. German *Ur-ur-ur-grossvater*, Russian *pra-pra-pra-ded*, Portuguese *bis-bis-bis-avô* 'great-great-great-grandfather'.

7.2   *Factors conditioning productivity*

Productivity is conditioned by semantic predictability, contextual appropriateness and paradigmatic factors. The words generated by the more productive processes are usually semantically predictable, while formations covered by the less productive processes often acquire unpredictable meanings (see Aronoff (1976) on the link between productivity and predictability, termed 'semantic coherence', and see also Baayen (1991:109)). If a productive affix assumes diverse meanings, so that its precise semantic function becomes opaque, this may result in the loss of its productivity. According to van Marle (1985), this was how the Dutch suffix *-lijk* (as in *waar-lijk* 'tru-ly') lost its productivity, and it is now limited to just a few adverbs.

Productivity correlates with the regularity with which a process is applied. Synonymous or almost synonymous affixes select the stems they combine with from roughly complementary domains; this affects their respective degrees of productivity. This is known as the paradigmatic aspect of

productivity (see, for instance, van Marle (1985)). In Portuguese the suffix *-ção* is used to derived action nominalizations from verbs ending in *-izar* and *-(i)ficar*, e.g. *amplificar* 'amplify', *amplificação* 'amplification'; *flexibilizar* 'make flexible', *flexibilização* 'making flexible'; while the suffix *-mento* is preferably used to derive action nominalizations from the verbs which end in *-ecer* or just in *-ar*, e.g. *abastecer* 'fill tank with petrol', *abastecimento* 'filling tank with petrol'; *encaminhar* 'direct', *encaminhamento* 'process of directing something'. The two suffixes can thus be considered to be in complementary distribution, dependent on the type of verb they are used with (see Sandmann (1991:41–2)).

Synonymous or almost synonymous affixes tend to differ in their productivity. For instance, Brazilian Portuguese has productive diminutive derivations (marked with suffixes *-inho*, *-zinho*: see sections 6.3.1 and 8.2). Another way of forming diminutives is with the suffix *-mirim* (a loan from the Indian language Tupinambá, from the Tupí-Guaraní family: Sandmann (1988:46)); this is found only with a few nouns – e.g. *abelha-mirim* (bee-DIM) 'little bee', *pista-mirim* (track-DIM) 'little track' – and with place names, e.g. *Guajara-mirim*.

In languages with a rich derivational morphology, synonymous affixes tend to develop different overtones. In Portuguese, the augmentative suffix – masculine *-(z)ão*, feminine *-(z)ona* – can be considered almost fully productive with nouns and with adjectives, e.g. *grande* 'big', *grandão* 'very big', *livro* 'book', *livrão* 'a huge book' (cf. *sapatão* 'big shoe; lesbian' in section 6.3.1 above). Another augmentative suffix, masculine *-aço* (feminine *-aça*) is used only with nouns. In the modern colloquial language it almost always has either pejorative or highly positive connotations, e.g. *partida* 'catch, set of goods', *partidaço* (or *partidaça*) 'a good catch, a good set of goods', cf. pairs like *mulher-ona* (woman-AUG.1:FEM) 'a big woman' and *mulher-aça* (woman-AUG.2:FEM) 'a very attractive woman', or 'a big sloppy woman'.[14]

The contextual appropriateness of a derivational process has to do with lexical and semantic restrictions which block productivity – see examples in section 7.3. However, due to lexicalization of derivational processes, there is often no one-to-one correlation between productivity and predictability: see section 7.4.

7.3   *Factors restricting productivity*

Factors which restrict productivity of a process can be (I) phonological, (II) morphological and morphosyntactic, (III) semantic and pragmatic, or (IV) lexical.

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[14] The choice of gender forms of the augmentative suffixes is also used to convey different connotations; according to Sandmann (1988:33), using masculine forms to derive augmentatives from feminine nouns provides additional emphasis to the idea of a feminine referent being big and strong as a man (cf. Brazilian Portuguese *mulher-ão* (woman-AUG.1:MASC) 'a big woman', or *mulher-aço* (woman-AUG.2:MASC) 'a big and beautiful woman'.

7.3.1   *(1)Phonological factors*

The application of a morphological process may be blocked by the segmental phonological shape of a morpheme. Adjacent syllables with similar consonants tend to be avoided (see L. Bauer (1991) for the discussion of a tendency in English to avoid forming *-ly* adverbs on adjectives which end in *-ly*). In Portuguese, verbs which end in *-ecer* cannot form an action nominalization in *-ção*, e.g. *enfraquecer* 'become weak', *enfraqueci-mento* 'the action of weakening', not **enfraqueci-ção*; adjectives which contain *d* in their last syllable avoid using the de-adjectival nominal suffix *-idade*, e.g. *fluido* 'fluid', *fluidez* 'fluidity' (not **fluid-idade*) (Sandmann (1991):61–2)). In English, the suffix *-en* is used to form causatives only with adjectives which end in *-p*, *-t*, *-k*, *-s*, *-ʃ*, or *-d*, e.g. *deep-en*, but not **shallow-en* (Dixon (1982):22)).

Phonological restrictions may influence the choice between two synonymous affixes. In Latin, suffixes *-alis* and *-aris* which derive adjectives from nouns are in complementary distribution: *-aris* is used after a base which contains /l/, e.g. *consul-aris* 'belonging to consul'; *-alis* is used elsewhere, e.g. *navalis* 'naval, belonging to sea'; but when an /r/ follows an /l/ on the base, *-alis* is used as in *sepulchr-alis* 'belonging to burial'. Similarly, the choice between synonymous affixes can be conditioned by the shape of the base. German has two diminutive suffixes, *-chen* and *-lein* in partial complementary distribution: only *-chen* occurs after stem-final *-l(e)*, e.g. *Spiel-chen* 'little play', *Bäll-chen* 'little ball', and only *-lein* can be used after final /x, ŋ, g/, e.g. *Ring-lein* 'little ring', *Bäch-lein* 'little stream' (Ettinger (1974):75–6)). If a base ends in any other consonant, the two diminutive suffixes are free variants, e.g. *Häus-chen*/*Häus-lein* 'little house'.

7.3.2   *(11)Morphological and morphosyntactic factors*

Different morphological classes can behave differently as to the choice of the affixes they combine with. In German, the presence of the suffix *-in* 'feminine' blocks the use of the diminutive suffix *-chen* (Ettinger (1974):366)). In Tariana the suffix *-meni* is used to derive verbs from onomatopoeia, but not from other word classes, e.g. *munu-meni* 'mutter, say mnmn', *ih-meni* 'say ɨh!'.

The applicability of a derivational process may have to do with the origin of a suffix, or its base. In Russian, the denominal verbalizing suffix *-ovatj* is restricted to loanwords, and in Turkish the feminine suffix *-e*, of Arabic origin, appears only in Arabic loans. Spanish derivational suffixes in modern Ilocano tend to be used only with roots borrowed from Spanish (Rubino (1997):97)).

Some word-formation processes apply only to words of a certain syntactic subclass. Adjectives with *-ável/-ivel* 'having the capacity of the object of V' in Portuguese can only be formed on transitive verbs, e.g. *confiar* 'trust', *confiável* 'someone who can be trusted', but not **brilhável*, from intransitive *brilhar*

'shine' (Sandmann (1991:67)). In German, the nominalizing suffix *-ung* applies mostly to transitive verbs (Panagl (1987:130)).

7.3.3   (III) *Semantic and pragmatic factors*

A specific semantic feature may be a prerequisite for the application of a derivational process. In Portuguese, the negative prefix *in-* cannot be used with bases which already have a negative meaning, e.g. *in-válido* 'not valid', but not *in-doente* 'not ill' (Sandmann (1991:65)). Compound adjectives ending in *-ed* in English – such as *blue-eyed*, *red-nosed* – can only contain nouns which are either inalienably possessed (as body parts), or in a part–whole relationship with the possessor, e.g. *red-roofed* (house). Thus, **three-carred (man)* is scarcely acceptable (Beard (1976); L. Bauer (1983:93)).

The suffix *-ish* in English can freely occur with basic colour adjectives (but not with their hyponyms) and with age, speed, dimension and physical property type, but less readily after adjectives describing human propensity (**cruel-ish*). Inchoative and causative *-en* derivations are frequent with most adjectival types (e.g. *quick – quicken*, *white – whiten*), but not with the human propensity type: **rude-en* (Dixon (1982:20–1)).

Pragmatic factors which block the productivity of a process have to do with its stylistic and semantic overtones. In Portuguese, the de-adjectival nominalizing derivational suffix *-ice* has strong pejorative connotations: e.g. *chato* 'nasty', *chatice* 'nastiness'. Consequently, it can only be used on stems with neutral meaning if it can have a pejorative interpretation, e.g. *criança* 'child', *criancice* 'child-like stupid behaviour'. Stems which cannot have pejorative meaning may not be used with this suffix, e.g. *legal* 'good; loyal', but not **legalice*. Similarly, for reasons of semantic coherence, Portuguese does not usually permit co-occurrence of augmentatives and diminutives.

Stylistic incompatibility blocks the use of highly colloquial roots with high-flown prefixes in Portuguese, e.g. *re-* 'again' cannot combine with colloquial *botar* 'put' (Sandmann (1991:63)). The agentive suffix, *-nik*, in itself a loan from Slavic into English, used to have strong negative connotations because of its association with Soviet Russia (this is why certain people disliked formations such as *mit-nik* 'pertaining to M(assachusets) I(nstitute) (of) T(echnology)': see section 7.4); this could have been a factor in 'blocking' its productivity.

7.3.4   (IV) *Lexical factors*

Certain word formations are limited to one or a few individual roots. The ending *-ric* in English occurs only in conjunction with *bishop* (Lightner (1975:633)). In Modern Hebrew, the causative-factitive stem *šafel* is used with only a few verb roots, e.g. *xazar* 'return', *šixzer* 'reconstruct (a building)' (cf. the ordinary causative *hexzir* 'make return') (Aikhenvald (1990:72)). Similarly, a partial reduplication (of the two final consonants) as a means of forming diminutives

of nouns is restricted to a few masculine nouns, e.g. *gvarvar* 'little boy' from *gever* 'man', *znavnav* 'little tail' from *zanav* 'tail', *hatul-tul* 'little cat' from *hatul* 'cat' (Masson (1974:266)). The reduplication of the two final consonants and the vocalic pattern $C_1C_2aC_3C_2aC_3$ is used with a few adjectives, mostly denoting colour, to indicate lesser quality, e.g. *kaxol* 'blue', *kxalxal* 'blueish'; *adom* 'red', *adamdam* 'reddish', *šamen* 'fat', *šmanman* 'fattish' (Aikhenvald (1990:57)).

7.4   *Lexicalization and predictability*

Productive derivational devices can get lexicalized, resulting in semantically unpredictable forms. We mentioned how in Portuguese augmentative derivations from nouns can acquire unpredictable meanings, as in *palavra* 'word', *palavr-ão* (word-AUG) 'obscenity, swearword' – see section 6.3.1.

The semantic development of individual affixes can contribute to their lexicalization. Within one language, diminutives and augmentatives can express different degrees of dimension. Modern Hebrew has several strategies for forming diminutives. The most productive type is with the suffix *-on* or *-it*; there is also a diminutive with reduplication restricted to a few roots (see Masson (1974), and section 7.3 above). Some nouns allow the formation of more than one diminutive; the diminutive with *-on* implies a lesser degree of diminution, while the other technique implies more diminution and endearment, e.g. *kelev* 'dog', *kalb-on* 'a little dog', *klav-lav* 'a nice little dog'; *sak* 'bag', *sak-it* 'a small bag', *sakik* 'a nice small bag'. Occasionally, especially in children's books, the two techniques co-occur, to convey the idea of excessive diminution and endearment, e.g. *klav-lav-on* 'a very little cute doggie' (Masson (1974:267)).

In Italian and in Viennese German diminutive meanings often have deprecative connotations – cf. Italian *tren-ino*, Viennese German *Bahnd-erl* 'a small, slow and unimportant train' – and are often unpredictable; for instance, *mal-etti* (lit.: 'little sicknesses' (from *male* 'illnesses')) is used to refer to unimportant sicknesses or discomforts, particularly of women (see Dressler and Merlini Barbaresi (1994:120ff.), for further examples).

When an affix gets lexicalized in such a way that it 'loses' its original meaning, semantic restrictions on how it can combine with other affixes may disappear. Standard Portuguese does not allow a semantically weird combination of augmentative and diminutive; but a derivation like *fac-ão-zinho* (knife-AUG-DIM) 'a little machete' is possible (Sandmann (1991:63)). The diminutive often has a meaning of 'nice and cute', and the augmentative may indicate 'a real one', hence the possibility of a word like *obrigad-ão-zinho* (thank.you-AUG-DIM) 'a really nice thank-you'.

Lexicalization of productive and regular deverbal valency-changing derivations is a widely attested phenomenon. Turkish passives tend to become

lexicalized, resulting in the creation of examples such as *bur-ul* (twist-PASS) 'be twisted, be wrung; writhe (e.g. with pain)', or *göm-ül* (bury-PASS) 'be buried; sink into (e.g. into an armchair)'.

Words derived by active derivational mechanisms may diverge from their productively formed sense. The Modern Hebrew verb has seven types of root-and-pattern derivations which cover simple (underived) form, passive, intensive, passive of intensive, causative, passive of causative, and reflexive–reciprocal. This last derivation has its regular reciprocal and reflexive meaning with some roots (e.g. **k/x t b/v**: *hitkatev* 'write to each other'; **r x c**: *hitraxec* 'wash oneself'), but not with others. With the root **g n b/v** 'steal', the reflexive–reciprocal formation *hitganev* means 'sneak oneself quietly into a place', and with **g d l** 'be big', the derivation, *hitgadel*, means 'consider oneself great'. The causative derivation usually has a causative meaning, as in *hirhic* 'make run' (from the root **r h c**). But the causative of the root **g n b/v** 'steal', *higniv* means 'smuggle, sneak'. With roots referring to colours, the causative derivation also has an inchoative meaning, e.g. **lavan** 'white', *hilbin* 'make white; get white' (see further examples of semantic irregularities in Berman (1978:92)).

Another problem is the existence of 'gaps' in otherwise regular paradigms. Verbs may lack certain forms; for instance, *yašen* 'sleep' and *tiyel* 'take a walk' have no causative (Berman (1978:91)), and some intransitive verbs do not have a simple stem, but are used in the passive form instead (similar to deponent verbs in Latin or Greek), e.g. *ni-xnas* 'enter', *neelam* 'disappear', *needar* 'be absent', *nixna* 'surrender' (1978:99).

However, in spite of these 'anomalies', psycholinguistic experiments have shown that the semantics of Modern Hebrew verbal derivation does have psychological reality (1978:114:n.23); Ephratt (1997)). They can be described in terms of their prototypical meanings – such as passive, causative and reflexive–reciprocal – and extensions from these; however, the lexicalized 'exceptions' like the ones cited above have to be listed separately in the lexicon.

In a language with rich derivational morphology, productivity and semantic predictability of an affix may not go hand in hand – an affix may be highly productive from the quantitative point of view, and yet it can yield semantically unpredictable combinations. The agentive suffix *-nik* used to derive nouns from nouns in Russian is a case in point. Its general meaning is usually defined as 'someone/something with some properties of X' (see Shvedova (1970:99)), e.g. *kl'uč-nik* (key-DER) 'house-keeper; a person who holds keys', *desant-nik* (landing.party-DER) 'member of a landing party', *rabot-nik* (work-DER) 'worker'. But in a great many cases the exact meaning of a stem + *-nik* is hardly predictable. This suffix can derive the name of a recipient, e.g. *sous-nik* (sauce-DER) 'a pot for sauces'; a place, e.g. *ptič-nik* (bird-DER) 'place where birds are kept'; a written work, e.g. *vopros-nik* (question-DER) 'a questionnaire', *son-nik* (dream-DER) 'a book which interprets dreams'; or a territory,

e.g. *vinograd-nik* (grape-DER) 'vineyard'. A classic example of 'unpredictability' of the meaning of *-nik* in Modern Russian comes from its combinations with the roots referring to the periods of the day: 'morning' (stem *utren-*), 'evening' (*večer-*) and 'night' (*noč-*): *utren-nik* means 'morning frost' or 'morning performance', *večer-nik* means 'a tertiary student who attends lectures in the evening', and *noč̃-nik* means 'night lamp'.[15]

Unpredictable affixes can be morphologically idiosyncratic. The derivation of names for inhabitants of a certain place is a case in point. In British English, an inhabitant of London is called a *Londoner*; of Nottingham is called a *Nottinghamian*; of Glasgow, a *Glaswegian*; of Manchester, a *Mancunian*; a person from Newcastle-on-Tyne and thereabouts is called a *Geordie*. In Australian English some names of inhabitants are formed according to a regular pattern, e.g. *Adelaide – Adelaidian*, *Brisbane – Brisbanian*, sometimes with a stress shift, as in *Cánberra – Canbérran*, while others display idiosyncrasies, e.g. *Sydney – Sydney-ite*, or *Sydney-sider, Melbourne – Melburnian*.

When a productive polysemous affix gets borrowed into another language, its meaning is usually transparent; in other words, it is no longer unpredictable. The Russian agentive *-nik* was borrowed into English in its agentive sense (see Matisoff (1991:446)); the 'success' of this borrowing appears to have been assured by the previous existence of borrowings from Yiddish with this suffix, e.g. *nud-nik* 'pain-in-the-ass' (Slavic root *nud* 'nag' + *-nik*); cf. *allright-nik* 'someone who is doing all right for himself', *beat-nik* 'member of *beat* generation', *refuse-nik* 'a Soviet Jew who was refused a visa to emigrate', *mit-nik* 'person from the Massachussetts Institute of Technology (MIT)'. But see section 7.3 above on negative connotations associated with it.

7.5   *Loss and gain of productivity*

Word formation devices can lose their productivity. This results in their 'fossilization' whereby they may eventually become inseparable from the root. In numerous Arawak languages of South America, active verb stems end in *-ka* and *-ta*. Synchronically, these syllables, called 'thematic affixes', are part of the stem, while historically they go back to valency-increasing derivations (see Aikhenvald (1999d)). The classifier and derivational suffix *-daɾi* is very productive in Baniwa. However, in the closely related language Tariana it is found in just one lexical item where it can be considered as fused with the stem (see section 8.2).

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[15] *Večernik* can be alternatively considered as derived from the adjective *večer-n-ij* 'referring to evening' with a suffix *-ik* (an allomorph of *-nik*: Shvedova (1970:77)); *nočnik* could be derived either from *noč* 'night' or from *noč-ŋ-oj* 'referring to night time'. A similar derivation from *dnev-n-oj* 'referring to daytime' (from *denj* 'day') is *dnev-n-ik* 'diary'.

Semantic regularity of a derivational process can decrease as the result of historical development. Verbal derivation was semantically more regular in Biblical Hebrew than it is in Modern Hebrew. The high degree of unpredictability of the reciprocal–reflexive stem could be accounted for by the substratum influence of reflexive forms in Yiddish and Slavic languages.

Decrease in semantic regularity often goes together with the loss of formal productivity. In Tariana, the formation of causatives on transitive verbs involves very few roots. Consequently, its meaning becomes idiosyncratic, e.g. *-ka* 'see', *-keta* (from *-ka-ita:* see+CAUS) 'meet' (not 'make see') (compare semantic regularity in causatives derived from intransitive verbs: *-ema* 'stand', *-emeta* (from *-ema-ita*) 'put, make stand').

The productivity of an affix can increase, by extending the sphere of its usage. An obvious example is the proliferation of an affix of foreign origin as the result of foreign influence. This is the case with Spanish suffixes *-ero* (MASC), *-era* (FEM), to indicate occupations in modern Ilocano. While the suffix was originally restricted to Spanish loan nouns (e.g. *mensahero*, *mensahera* 'messenger'), it can now be employed with Spanish roots which do not take this suffix in Spanish, e.g. *botika* 'drugstore', *botikero* 'druggist' (Rubino (1997:97)). In a similar way, gender as a derivational device made its way into some Ilocano nouns under Spanish influence, e.g. *lelong* 'grandfather' and *lelang* 'grandmother' (influenced by Spanish *abuelo*, *abuela*); *manong* 'brother' and *manang* 'sister' (cf. Spanish *hermano*, *hermana*) (1997:76). In Modern Russian the productivity of the suffix *-cija* used to derive abstract nouns from foreign roots has drastically increased (as in *revolu-cija* 'revolution', *separa-cija* 'separation', *depillja-cija* 'depillation', etc.), because a large number of English loanwords have came into Russian since the beginning of *perestroika*.

The productivity of processes may differ depending on speech styles. In a number of languages, e.g. Iroquoian (Chafe (1997)) or Guaraní, the extensive use of incorporation is the mark of elaborate, even high-flown style (see also section 3, on the stylistic effects of incorporation in Carrier, an Athabascan language). The proliferation of diminutive formations in Russian is a mark of a rather low-class style.[16]

7.6   *Productivity and creativity: hierarchy of productivity*

Productivity is 'the property of the language-system which enables native speakers to construct and understand an indefinitely large number of utterances' (Lyons (1977:76)). It is distinct from *creativity* – 'the language user's ability

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[16] Occasionalisms can be a stylistic property of a writer, e.g. numerous derivations created by Solzhenitzyn in his literary works, which reflect his ideas but have never been accepted, such as *obrazovan-schina* (educated-DER:PEJ) 'useless people who belong to the educated strata'.

to extend the system by means of motivated, but unpredictable, principles of abstraction and comparison'. Creativity in the application of a rule or a process by analogy may be indicative of its productivity (see Van Marle (1985), for feminine *-in* in Dutch).

Creativity results in 'ad-hoc' formations which are normally understandable to speakers but sound unusual and often produce a stylistic effect. In section 7.3 above, we mentioned the pejorative suffix *-ice* in Brazilian Portuguese. Nouns derived from adjectives with a neuter meaning (e.g. *adolescente* 'teenager', *adolescentice* 'adolescent-like behaviour'; *adulto* 'adult', *adultice* 'adult-like behaviour') are accepted by native speakers only after being put into an appropriate negative context, such as 'Stop this teenager-like behaviour!', or 'Stop behaving like a nasty adult!' (Sandmann (1991):89–90)). Unlike productive derivations, these ad-hoc formations are often short-lived.

The question of whether there is any hierarchy in productivity or lexicalization of different types of word-formation deserves further study. The data from Indo-European languages indicate that action nominalizations tend to be more productive and regular than agent nominalizations, while instrumental nominalizations appear to be less productive (Panagl (1987):136–7)).

Class-changing derivations are less prone to lexicalization and semantic unpredictability than class-preserving ones. This is why deverbal nouns and denominal verbs are typically semantically predictable. Only totally productive, regular and predictable derivational devices develop into inflectional categories – see section 8.

8   Grammaticalization and lexicalization in word-formation

Grammaticalization focusses on how grammatical forms and constructions develop out of lexical items. Lexicalization involves the opposite phenomenon: the development of grammatical units into lexical items.

8.1   *Grammaticalization in word-formation*

Lexical morphemes, especially parts of compounds, often develop into derivational affixes. Modern English suffixes *-ric* in *bishop-ric*, *-hood* in *child-hood*, *-ly* in *friendly*, and *-dom* in *kingdom* come from Old English words with the meaning of 'dominion', 'quality', 'form, body' and 'jurisdiction' respectively (L. Bauer (1983)). The origin of some English affixes in independent lexical items is synchronically transparent, e.g. *-ful* (*full*) or *-able* (*able*). In Kana (Cross-River; Ikoro (1996):61)) the augmentative prefix *ká-* was probably derived from the word for 'mother'.

Grammaticalization theory makes a number of predictions concerning the properties of derivational affixes. Firstly, compared to roots, affixes are generally

shorter, cf. English -*dom* with Old English *dōm* 'judgement, doom' (with a long vowel) (in agreement with the Parallel Reduction Hypothesis which suggests that 'form and meaning covary' in grammaticalization: Bybee, Perkins, and Pagliuca (1994:19–21)).

Morphemes with a status intermediate between roots and affixes, such as German -*schaft* and -*weise* discussed in section 6.2, and English forms -*like*, -*worthy*, -*wise* (Haspelmath (1992:72)), are the result of an as-yet-incomplete grammaticalization from independent lexical items into affixes (see also Lehmann (1995)).

When an independent noun grammaticalizes as a derivational affix, it may still retain some of the syntactic properties of a free noun. Numerous Romance languages have a suffix used to form adverbs from adjectives which comes from the accusative form of Latin feminine noun *mens* 'mind', -*mentem*, e.g. French -*ment*, Portuguese and Italian -*mente*. Synchronically, in all these languages this suffix requires the feminine form of an adjective, e.g. French *franche-ment*, Portuguese *franca-mente* 'openly, frankly'. In all these languages this suffix is very productive (see, for instance, Scalise (1990), for Italian). Only in Portuguese and in Spanish does this suffix display another unusual peculiarity which indicates its connection with an independent word: it undergoes a process comparable to coreferential deletion in a sequence of two adverbs, e.g. *sabia- e prudente-mente* (lit.: 'wise- and cautious-ly') rather than *sabia-mente e prudente-mente* 'wisely and cautiously' (see Sandmann (1988:76–9)).

Verb compounding can also result in the creation of new derivational affixes. For instance, in Alamblak (Papuan, East Sepik) the verb *hay* 'give' developed into a causative 'marker' when compounded. In Tariana, compounded verbs get grammaticalized as aspect markers (such as -*síta* 'finish' > -*sità* 'anterior'; -*máya* 'cheat' > -*mayà* 'almost do something': Aikhenvald (1999b)). In Yimas (Papuan; Foley (1997)) applicative affixes come from grammaticalized verb roots: the benefactive -*ŋa* comes from -*ŋa* 'give', and *pampay*-'kinetic; motion toward' comes from *pay*- 'carry'.

In a number of Australian languages, compounded verbs get grammaticalized as markers of motion and direction, e.g. 'coming' and 'going' aspect in Yidiny in Dixon (1977:219–27) and the development of affixes of motion and direction from independent verbs in Adnyamathanha (Tunbridge (1988)). Similar phenomena are found in Pirahã (Brazil; Everett (1986:300–1)) and Yagua (Peba-Yagua; D. L. Payne and T. E. Payne (1990:413); D. L. Payne (1990:225)).

Fully productive derivational affixes can develop into what can be considered inflectional markers. The Latin purposive with -*(t)um* (traditionally known as 'supine') is an inflectional category which developed out of abstract nominalizations with -*tu*- (Panagl (1987:138–43)). Examples of this sort are rare.

8.2   *Lexicalization in word-formation*

Lexicalization in word formation involves a change in the status of a marker, from an inflectional to a derivational morpheme. This goes together with the loss of productivity. In Estonian, the Proto-Balto-Finnic instructive case survives only in a few expressions, predominantly involving body parts, e.g. *palja jalu* (naked+INSTR foot+INSTR) 'barefoot' (Laanest (1975:109); Mürk (1990):199)). The prolative case ('along', from Proto-Balto-Finnic *-tsek* or *-tsen*) survives in just a few forms, e.g. *meri-tsi* 'sea-ways, by way of sea'. The noun class marker *-daɾi* 'human nonfeminine' is widely used in Baniwa of Içana (Arawak) to mark agreement, e.g. *ačiãɾi mačia-daɾi* (man good-NCL:HUMAN) 'a good man'. In Tariana, a closely related language, this agreement marker survives in just one word, *pe-daɾi* (long.ago-HUMAN) 'old person', as a derivational suffix.

If a language loses gender agreement, gender markers become fossilized, whereby they lose their inflectional functions and may only survive as derivational devices. This is the case in some Australian languages of Arnhem Land (Sands (1995:255–6)). In Warray (Harvey (1987:55ff.)) noun class prefixes become lexicalized to nouns; the pronominal agreement is regular, but the system of adjective agreement with nouns is being lost. Similarly, in Bare, a dying Arawak language from Amazonia, agreement in gender was lost, but overt gender marking on nouns with female referents is maintained, and consequently the gender is now a derivational, and not an inflectional, category.

What is an inflectional morpheme in one language can be derivational in a closely related one. The locative case marker *-ɾiku* in Baniwa, an Arawak language from Brazil, corresponds to a marker of locative nominalization in a closely related language, Tariana. It is then hard to decide whether the inflectional or the derivational function was the primary one (which brings us back to the problem of fuzzy boundaries between inflection and derivation – see section 6.1).

Derivational affixes, once they are not fully productive, can become fossilized and not even recognizable as affixes. The same can happen with compounds. For instance, English *lord* and *lady* derive from Old English compounds *hlāford* < *hlāf-weard* 'loaf keeper', *hloef-dīge* 'loaf kneader' respectively (Matthews (1991):93)); Russian *spasibo* 'thank you' comes from *spasi-bog* (save:IMPV-god) (Vasmer (1953–8)). Similarly, in English, *goodbye* comes from a phrase *God be with you*. In Mandarin Chinese, many polysyllabic words go back to lexicalized compounds, e.g. *tʰauiɛn* 'contempt' (originally from *tʰau* 'beg' and *iɛn* 'contempt'). In these cases, the compounds are to be considered synchronically inseparable words.

When incorporated structures stop being productive, they can become lexicalized. Lexical compounds (type 1), once they lose their productivity, may

become semantically non-compositional and get lexicalized. Urubu-Kaapor (Tupi- Guarani; Kakumasu (1986:394)) lost productive noun incorporation (typical of many Tupi-Guarani languages – see Jensen (1999)). The only traces of noun incorporation remained in fossilized formations *pirok* (from *pirer* 'skin' and *jo'ok* 'take out') 'peel' and *pokok* (from *ipo* 'his fist' and *kok* 'touch') 'hit'. The same can happen to incorporation at every stage, from types 2 to 5 (see section 3.2). The following examples from Palikur, which has incorporation of types 2 and 3, show how incorporated body parts can get lexicalized with certain verbs, resulting in the creation of unique idiomatic expressions in which the meaning of the whole cannot be determined on the basis of the meaning of the parts (Aikhenvald and Green (1998)).

(56)   kamax-<u>duka</u>
        grab-<small>CHEST+REFL</small>
        'He had a quick snack'
        (literally 'he grabbed his own chest')

(57)   nah barew-<u>wok</u>
        1SG clean-<small>HAND</small>
        'I am poor, destitute'
        (literally 'I am clean-handed')

A derivational affix can become an enclitic and develop a tendency to be used on its own. In Portuguese, the diminutive suffix *-inho* has a variant with an initial *z* with complicated rules of distribution (see section 7.3, and Mattoso Câmara (1972:198); Sandmann (1988:41)). In colloquial language, *-zinho* can be added to any word, 'agreeing' with it in gender, e.g. *lobo-zinho* 'little wolf (MASC)', *loba-zinha* 'little she-wolf (FEM)'. In northern Brazil, *-zinho/-zinha* freely combine with any noun or determiner, e.g. *esse-zinho*, *essa-zinha* 'this little one (MASC, FEM')'; *um-zinho*, *uma-zinha* (indefinite article-DIM), and can even be used by themselves (e.g. *zinho* 'a little one (MASC)').

In just a few known cases, derivational affixes develop into independent lexical items. The forms *ism* and *ology* are now used in English as independent lexemes, especially in the plural, e.g. the title of a book *Isms and Ologies* (see L. Bauer (1983:35)). Terms *emic* and *etic* which refer to different levels of linguistic analysis arose from a reinterpretation of *phon-emic* and *phon-etic* (1983:35).

9   Conclusions

This chapter has surveyed various processes by which languages of different structural types expand and enrich their lexicon. These processes divide into compounding – which operates with what can be used as free morphemes – and derivation – which operates with bound morphemes. Compounding is

characteristic of analytic languages while derivation can be particularly rich in synthetic languages.

For languages with a non-isolating profile, a distinction is usually made between inflectional morphology – which produces fully productive categories of relevance to the rules of syntax – and derivational morphology which creates new words. Isolating languages tend to have little derivational morphology and no inflections. Noun incorporation is often – but not always – employed in polysynthetic languages to enrich their lexicon and also to manipulate syntactic relations and pragmatic focus in a clause.

Types of derivational morphology correlate with other typological properties of a language. For instance, verb compounding is mostly found in head-marking languages.

Derivational processes can be category-changing or category-preserving; and in many synthetic languages they serve to identify word classes. They differ with respect to their productivity, regularity and predictability. Derivational processes can involve affixation or other morphological processes. Affixes can be continuous or discontinuous. Discontinuous affixes, or transfixes, abound in Semitic languages where they create a typologically unique root-and-pattern morphology. Morphological processes include apophony, reduplication, prosodic modification, conversion, repetition and metathesis. Derivational devices which involve more than one root but are distinct from compounding are acronyms, clippings and abbreviations.

Unlike inflectional processes which are in general regular and predictable, derivational devices may get lexicalized and become semantically unpredictable. Derivational morphemes may develop out of independent lexemes, or parts of compounds; in rare cases they become independent words.

This chapter has shown that word formation tends to exhibit many irregularities and gaps; while many languages tend to exhibit certain tendencies in what derivational processes they prefer, exceptions abound. Studying derivational morphology and word-formation is a challenging task for a field worker.

10   Suggestions for field workers in describing types of word-formation

It may be useful to provide field linguists – working on a previously undocumented, or poorly documented, language – with a set of questions which need to be asked in order to establish a complete picture of word-formation processes.[17] (After each question, relevant sections of this chapter are indicated in parentheses.)

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[17] This is based on the author's own field experience in different parts of the world, student supervision in Brazil and Australia, and the reading of grammars.

Preliminary information is needed as a starting point. This includes:
- typological characteristics, e.g. whether the language is head-marking or dependent-marking (see also Question 8 below).
- word classes: what are the open classes (e.g. nouns, verbs, adjectives) and closed classes?
- grammatical criteria for open classes and properties of closed classes.
- information on the relationship between word class and functional slot (e.g. whether verbs can be used as predicates only, or also as predicate arguments; and whether nouns can only be used as arguments, or also as modifiers within a noun phrase and/or as predicates).
- transitivity classes of verbs.
- marking of grammatical relations (e.g. by cases or adpositions, and/or by cross-referencing markers on the verb, and/or by constituent order).
- nature of sources used, e.g. texts, lexical and grammatical elicitation.

Soon after commencing linguistic field work, one should concentrate on gathering and analysing texts. The word formation patterns found in texts should then be confirmed and systematically studied through carefully directed elicitation.

10.1 Questions to ask

1. Is a distinction needed between phonological word and grammatical word? What are the criteria for each type of word? (Section 1.)
2. What morphological type does the language belong to, according to the two sets of parameters: (i) by degree of internal complexity of grammatical words – analytic, synthetic, polysynthetic; and (ii) by the transparency of morphological boundaries between the morphemes within a grammatical word – isolating, agglutinating, fusional? Where would you place the language in Figure 1.1? (Section 2.)
3. If the language is polysynthetic, what features of polysynthesis (of those listed in section 2.1) does it have? What is the structure of polysynthetic verbs, and nouns?
4. Does the language have nominal incorporation within a verb? (Section 3.)
   4a. If it does, what are the formal properties of the incorporating structures? (Section 3.1.)
   4b. What functional types of incorporation are there? (Section 3.2.) Illustrate each of them, with textual examples. If the language has more than one incorporation type, show in what ways they are different.
   4c. What kinds of nouns get incorporated?
   4d. What are the syntactic functions – direct object (o), intransitive subject (s), transitive subject (a) or others – of incorporated nouns?

4e. Is there incorporation of adverbs and/or adpositions? What are the syntactic effects of this?
5. Does the language have a rich derivational morphology? Is there any lexical iconicity, e.g. sound-symbolic forms, ideophones, expressives? Can phonesthemes be established? (Section 4.)
6. Does the language have productive compounding? (Section 5.)
   6a. If so, what criteria (phonological, morphological, morphosyntactic and semantic) can be used to distinguish nominal compounds from phrases?
   6b. Which word classes can participate in nominal compounding? What are the morphological properties of compounded forms?
   6c. What types of nominal compounds does the language have?
   6d. Does the language have verbal compounds? If so, is compounding distinct from verb serialization? What verb classes can be compounded and what is their semantics (e.g. resultative or parallel compounds)?
   6e. Can word classes other than nouns and verbs enter into compounds?
7. Is it possible to distinguish strictly between inflectional and derivational morphology? Which of the properties listed in table 1.4 (Section 6.1) are applicable? Do any categories simultaneously have inflectional and derivational functions?
8. What is the structure of the root (e.g. continuous, discontinuous)? What units do derivational processes apply to (roots, stems, formatives shorter than stems, noun phrases, etc.)? Are there any intermediate units between roots and affixes (e.g. combining forms)? (Section 6.2.)
9. What are the types of derivational processes? For each, specify whether it is productive, regular, semantically predictable. (Section 6.3.)
   9a. Are there ways of deriving members of open classes from one another (category-changing morphology)? Are there ways of deriving subclasses of open classes (e.g. transitive verbs from intransitives)? (Section 6.3.1.)
   9b. Do open and closed classes have any class-specific morphological characteristics (category-defining morphology)? (Section 6.3.1.)
   9c. Are there any devices which are applicable to members of several word classes? If so, do they display different behaviour with different classes? (Section 6.3.1.)

11   Suggestions for further reading

Detailed analysis of word formation and how it differs across languages can be found in Bloomfield's *Language* (1933) and Matthews's *Morphology* (1991). For a discussion of the typological classification of languages, see Sapir (1921), Comrie (1981a) and Croft (1991). The sources for English derivational morphology and related problems are L. Bauer (1983) and, especially, Marchand

(1969). Further discussion of morphological processes is found in S. R. Anderson (1992), Dressler (1987) and Bybee's *Morphology* (1985). The *Handbook of Morphology* edited by Spencer and Zwicky (1998) provides a selection of papers on different issues of word-formation. There is an extensive literature on grammaticalization and lexicalization patterns, including Lehmann (1995).

A number of chapters in the present volume discuss issues related to those discussed here, including the chapters on Parts-of-speech systems (vol. I, chapter 1), Inflectional morphology (chapter 3 of this volume), Lexical typologies (vol. III, chapter 2), and Lexical nominalization (chapter 6, this volume).

Acknowledgements

2   Lexical typologies

Leonard Talmy

0   Introduction

This chapter addresses the systematic relations in language between mean-
ing and surface expression. Our approach to this has several aspects. First,
we assume we can isolate elements separately within the domain of meaning
and within the domain of surface expression. These are semantic elements like
'Motion', 'Path', 'Figure', 'Ground', 'Manner', and 'Cause', and surface ele-
ments like 'verb', 'adposition', 'subordinate clause', and what we will charac-
terize as 'satellite'. Second, we examine which semantic elements are expressed
by which surface elements. This relationship is largely not one-to-one. A com-
bination of semantic elements can be expressed by a single surface element,
or a single semantic element by a combination of surface elements. Or again,
semantic elements of different types can be expressed by the same type of sur-
face element, as well as the same type by several different ones. We find here
a range of typological patterns and universal principles.

We do not look at every case of semantic-to-surface association, but only at ones that constitute a pervasive pattern, either within a language or across languages. Our particular concern is to understand how such patterns compare across languages. That is, for a particular semantic domain, we ask if languages exhibit a wide variety of patterns, a comparatively small number of patterns (a typology), or a single pattern (a universal). We will be interested primarily in the last two cases, as well as in the case where a pattern appears in no languages (universal exclusion). Our approach can be summarized as in this procedural outline:

(1)   ('entities' = elements, relations, and structures: both particular cases
        and categories of these)
        a. Determine various semantic entities in a language.
        b. Determine various surface entities in the language.
        c. Observe which (a) entities are expressed by which (b) entities – in
            what combinations and with what interrelations – noting any
            patterns.
        d. Compare findings of this sort across languages, noting any
            patterns.

This outline sketches the broad project of exploring meaning–surface relations. But our present undertaking is narrower in several ways. First, there are two directions for exploring meaning–surface relations, both of them fruitful. One direction is to hold a particular semantic entity constant and observe the surface entities in which it can appear. For example, one could observe that the semantic element 'negative' shows up in English as a verb-complex adverb (will *not* go), as an adjective (*no* money), as an adjectival derivational affix (*un*kind), and as a verbal incorporated feature (*doubt*); in Atsugewi as a verb requiring an infinitive complement (*mit* ^{h}*i:p* 'to not'); and in some languages as a verbal inflection. The other direction is to hold constant a selected surface entity, and to observe which semantic entities are variously expressed in it. The present chapter explores in only this second direction.

Within this limitation, we narrow our concerns still further. One can examine lexemes consisting of different numbers of morphemes for the meanings that appear in them. At the low end of the scale are the 'zero' forms. Thus, by one interpretation, there is a missing verbal expression in English constructions like *I feel like [having] a milk shake* and *I hope for [there to be] peace*, or in German ones like *Wo wollen Sie denn hin [gehen/fahren/ . . .]?* 'Where do you want to go?'. One might conclude that such missing verbal meanings come from a small set, with members like 'have', 'be', and

'go'.[1] Alternatively, one could investigate the meanings that are expressed by surface complexes. A comparatively lengthy construction might encode a single semantic element. Consider the approximate semantic equivalence of the construction *be of interest to* and the simple verb *interest*, or of *carry out an investigation into* and *investigate*. However, this chapter looks only at the mid-portion of this range: single morphemes and, to a lesser extent, words composed of root and derivational morphemes.

In particular, we will investigate one type of open-class element, the verb root, the topic of section 1, and one type of closed-class element, the 'satellite', defined and treated in section 2. These two surface types are vehicles for roughly the same set of semantic categories.[2] The aim in these two sections is to set forth a class of substantial meaning-in-form language patterns, and to describe the typological and universal principles that they embody. Section 3 looks at the effect of these patterns on semantic salience in the complex composed of both verb and satellites together. The conclusion in section 4 argues the advantages of the approach adopted here.

0.1   *Characteristics of lexicalization*

We outline now some general characteristics of lexicalization, as part of this chapter's theoretical context. A meaning can be considered associated with surface forms mainly by three processes: lexicalization, deletion (or zero), and interpretation. We can contrast these three in an example where no one process clearly applies best. Consider the phrase *what pressure* (as in *What pressure was exerted?*), which asks 'what *degree of* pressure' – unlike the more usual *what colour*, which asks for a particular identity among alternatives. How does the 'degree' meaning arise? One way we could account for it is by lexicalization, that is, the direct association of certain semantic components with a particular morpheme. By this interpretation, *pressure* here differs from the usual usage by incorporating an additional meaning component: $pressure_2 = $ *degree of pressure$_1$* (or, alternatively, there is a special *what* here: *what$_1$ degree of*). Or we could assume that some constituent like *degree of* has been deleted from the middle of the phrase (or that a zero form with the meaning 'degree of' now resides there). Or else we could rely on a process of semantic interpretation,

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[1] A zero form in a language can represent a meaning not expressed by any actual lexical item. For example, no German verb has the general 'go' meaning of the zero form cited. *Gehen* implies walking, so that one could not ask *Wo wollen Sie denn hingehen?* of a swimmer.

[2] Talmy (2000b: ch. 2) argues that the referents of the closed-class forms of a language constitute its basic conceptual structuring system. Accordingly, the significance of the fact that the set of semantic categories presented here are also expressed by the closed-class satellite form is that these categories are therefore part of the basic structuring system of a language.

based on present context and general knowledge, to provide us with the 'degree' meaning.[3]

In general, we assume here that lexicalization is involved where a particular meaning component is found to be in regular association with a particular morpheme. More broadly, the study of lexicalization must also address the case where a *set* of meaning components, bearing particular relations to each other, is in association with a morpheme, making up the whole of the morpheme's meaning. In the clearest case, one morpheme's semantic makeup is equivalent to that of a set of other morphemes in a syntactic construction, where each of the latter morphemes has one of the original morpheme's meaning components. A familiar example here is the approximate semantic equivalence between *kill* and *make die*. However, such clear cases are only occasional: it would be unwise to base an approach to lexicalization on semantic equivalences solely between morphemes that are *extant* in a language. What if English had no word *die*? We would still want to be able to say that *kill* incorporates the meaning component 'cause'. As a case in point, this is exactly what we would want to say for the verb (*to*) *poison* 'kill / harm with poison', which in fact lacks a non-causative counterpart that means 'die / become harmed from poison' (*They poisoned him with hemlock.* / **He poisoned from the hemlock*).

To this end, we can establish a new notion, that of a morpheme's *usage*: a particular selection of its semantic and syntactic properties. We can then point to usage equivalences between morphemes, even ones with different core meanings, and even across different languages.

To consider one example, there is a usage equivalence between *kill* and *make appear*. *Kill* includes in its meaning the notion 'Agent action on Patient' ('causative') and, syntactically, takes an Agent subject and Patient object. This usage is equivalent to that of *make*, which incorporates the notion 'Agent-to-Patient relation', in construction with *appear* which incorporates the notion 'Patient acting alone' ('non-causative') and takes a Patient subject. Such

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[3] Apart from these three processes, an analyst can sometimes invoke what we might term *semantic resegmentation*. Consider the case of *shave* as used in (vi):

   (i)   I cut John
   (ii)   I shaved John
   (iii)   I cut myself
   (iv)   I shaved myself
   (v)   *I cut
   (vi)   I shaved

We could believe that a reflexive meaning component is present in (vi) due to any of the three processes just described: because it is lexicalized in the verb, deleted from the sentence, or to be inferred by pragmatics. However, we only need to assume that a reflexive meaning is present if we consider this usage to be derived from that in (ii)/(iv). We could, alternatively, conclude that the (vi) usage is itself basic and refers directly to a particular action pattern involving a single person, with no reflexive meaning at all.

relationships can be represented, for cases involving both lexical (L) and grammatical (G) morphemes, as:

(2)   usage of   usage of
       L_2 $=$ L_1 in construction with G
       (e.g. $L_2 = kill$, $L_1 = appear$, and G $= make$)

We can say here that L_2 incorporates the meaning of G and that L_1 either does not incorporate it or incorporates a meaning complementary to it. In the special case where a single morpheme can function equally as L_1 or L_2, we can say that it has a *range* of usages. For example, there is a usage equivalence between *break*$_2$ and *make break*$_1$, as seen in *I broke the vase* and *I made the vase break*, so that *break* can be said to have a usage-range covering both the causative and the non-causative. An equivalent way of characterizing such a usage-range is as in (3). As an example of this, the causative/non-causative usage-range of *break* equals the causative usage of *kill* plus the non-causative usage of *appear*.

(3)   usage-range of   usage of   usage of
       L_3 $=$ L_2 $+$ L_1
       where L_2 and L_1 are related as in (2)

One terminological note: we will refer to the meaning-in-form relation with three terms. They are 'lexicalization' from McCawley (e.g. 1968); 'incorporation' as used by Gruber (1965); and 'conflation', a term that was coined for this purpose by the author (Talmy (1972)) and that has now gained general currency. These terms have different emphases and connotations that will become clear as they are used below, but all refer to the representation of meanings in surface forms.

0.2   *Sketch of a motion event*

A number of the patterns looked at below are part of a single larger system for the expression of motion and location. We will here provide a sketch of this system. Additional analysis appears in Talmy (1975, 2000a: chs. 2 and 3).

To begin with, we treat a situation containing motion or the continuation of a stationary location alike as a 'Motion event' (with a capital 'M'). The basic Motion event consists of one object (the 'Figure') moving or located with respect to another object (the reference-object or 'Ground'). It is analysed as having four components: besides 'Figure' and 'Ground', there are 'Path' and 'Motion'. The 'Path' (with a capital 'P') is the path followed or site occupied by the Figure object with respect to the Ground object. 'Motion' (with a capital 'M') refers to the presence *per se* of motion or locatedness in the event. Only these two motive states are structurally distinguished by language. We will represent motion by the form 'MOVE' and location by 'BE$_{LOC}$' (a mnemonic

for 'be located').[4] In addition to these internal components, a Motion event can be associated with an external 'Co-event' that most often bears the relation of 'Manner' or of 'Cause' to it. All these semantic entities can be seen in the following sentences:

(4)   Manner: Cause:

        motion: The pencil rolled off the table   The pencil blew off the table

        location: The pencil lay on the table   The pencil stuck on the table
                                                     (after I glued it)

In all four sentences, *the pencil* functions as the Figure and *the table* as the Ground. *Off* and *on* express Paths (respectively, a path and a site). The verbs in the top sentences express motion, while those in the bottom ones express location. In addition to these states of Motion, a Manner is expressed in *rolled* and *lay*, while a Cause is expressed in *blew* and *stuck*.

The terms 'Figure' and 'Ground' were taken from Gestalt psychology but Talmy (1972) gave them a distinct semantic interpretation that is continued here. The Figure is a moving or conceptually movable object whose path or site is at issue. The Ground is a reference-frame, or a reference object stationary within a reference-frame, with respect to which the Figure's path or site is characterized.

These notions of Figure and Ground have several advantages over Fillmore's (e.g. (1977)) system of cases. The comparison is set forth in detail in Talmy (2000a: ch. 5), but some major differences can be indicated here. The notion of 'Ground' captures the commonality – namely, function as reference-object – that runs across all of Fillmore's separate cases 'Location', 'Source', 'Goal', and 'Path'. In Fillmore's system, these four cases have nothing to indicate their commonality as against, say, 'Instrument', 'Patient', and 'Agent'. Further, Fillmore's system has nothing to indicate the commonality of its Source, Goal, and Path cases as against Location, a distinction captured in our system by the MOVE/BE$_{LOC}$ opposition within the Motion component. Moreover, the fact that these Fillmorean cases incorporate path notions in addition to their reference to a Ground object – e.g., a 'from' notion in Source and a 'to' notion in Goal – opens the door to adding a new case for every newly recognized path notion, with possibly adverse consequences for universality claims. Our system, by abstracting away all notions of path into a separate 'Path' component, allows for the representation of semantic complexes with both universal and language-particular portions.[5]

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[4] These forms express universal semantic elements and should not be identified with the English surface verbs used to represent them. They are written in small capitals to underscore this distinction.

[5] Our Figure is essentially the same as Gruber's (1965) 'theme', but Gruber, like Fillmore, did not abstract out a semantic form like our Ground. Langacker's (1987) 'trajector' and 'landmark' are highly comparable to our Figure and Ground and, specifically, his landmark has the same abstractive advantages that Ground does over the systems of Gruber and Fillmore.
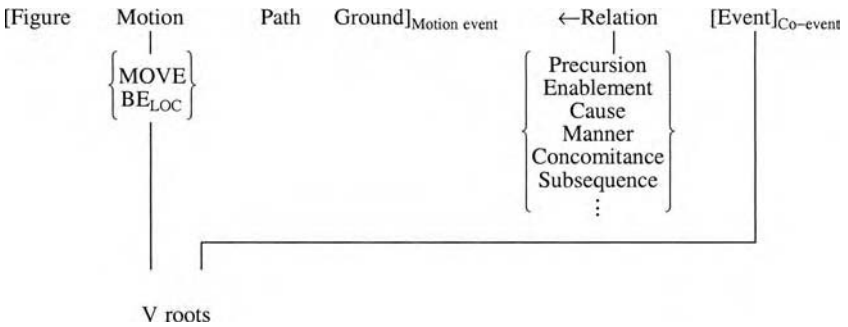
Figure 2.1 Co-event conflated in the Motion verb

1   The verb

In this study of the verb, we look mainly at the verb root alone. This is because the main concern here is with the kinds of lexicalization that involve a single morpheme, and because in this way we are able to compare lexicalization patterns across languages with very different word structure. For example, the verb root in Chinese generally stands alone as an entire word, whereas in Atsugewi it is surrounded by many affixes that all together make up a polysynthetic verbal word. But these two languages are on a par with respect to their verb roots.

Presented first are the three typologically principal lexicalization types for verb roots. In most cases, a language uses only one of these types for the verb in its most characteristic expression of Motion. Here, 'characteristic' means that: (i) it is *colloquial* in style, rather than literary, stilted, etc.; (ii) it is *frequent* in occurrence in speech, rather than only occasional; (iii) it is *pervasive*, rather than limited, that is, a wide range of semantic notions are expressed in this type.

1.1   Motion + Co-event

In a Motion-sentence pattern characteristic of one group of languages, the verb expresses at once both the fact of Motion and a Co-event, usually either the manner or the cause of the Motion. A language of this type has a whole series of verbs in common use that express motion occurring in various manners or by various causes. There may also be a series of verbs expressing location with various Manners or Causes, but they are apparently always much fewer. The meaning-to-form relationship here can be represented as in figure 2.1. Language families or languages that seem to be of this type are Indo-European (except for post-Latin Romance languages), Finno-Ugric, Chinese, Ojibwa, and Warlpiri. English is a perfect example of the type:

(5)   *English expressions of Motion with conflated Manner or Cause*

BE$_{LOC}$ + **Manner**

BE$_{LOC}$ **+ Manner**
a. The lamp *stood/lay/leaned* on the table
b. The rope *hung* across the canyon from two hooks

MOVE + Manner
non-agentive
c. The rock *slid/rolled/bounced* down the hill
d. The gate *swung/creaked* shut on its rusty hinges
e. Smoke *swirled/rushed* through the opening

agentive
f. I *slid/rolled/bounced* the keg into the storeroom
g. I *twisted/popped* the cork out of the bottle

self-agentive
h. I *ran / limped / jumped / stumbled / rushed / groped my way* down
   the stairs
i. She *wore* a green dress to the party

MOVE + Cause
non-agentive
j. The napkin *blew* off the table
k. The bone *pulled* loose from its socket
l. The water *boiled* down to the midline of the pot

agentive
m. I *pushed/threw/kicked* the keg into the storeroom
n. I *blew/flicked* the ant off my plate
o. I *chopped/sawed* the tree down to the ground at the base
p. I *knocked/pounded/hammered* the nail into the board with
   a mallet

Here, the assessment of whether it is Manner or Cause that is conflated in the verb is based on whether the verb's basic reference is to what the Figure does or to what the Agent or Instrument does. For example, in 'I rolled the keg . . .', *rolled* basically refers to what the keg did and so expresses Manner, whereas in 'I pushed the keg . . .', *pushed* refers to what I did, and so gives the Cause of the event.

To a speaker of a language like English, such sentences may seem so straightforward that they offer little to ponder. How else might such propositions be colloquially expressed? But in fact there are languages with very different patterns of expression. Even a language as seemingly kindred as Spanish *can express virtually none* of the above sentences in the way that English does, as is demonstrated below.

1.1.1   *The pattern underlying Co-event conflation*

We can indicate the type of conflation pattern involved here with constructions that represent the separate semantic components individually – i.e., that decompose or 'unpack' the sentences. The Manner or Cause notions conflated in the verbs are then best represented by separate subordinate clauses standing for Co-events. In these constructions, the subscript '$_A$' is placed before a verb to indicate that the verb is agentive (thus, $_A$MOVE = CAUSE to MOVE). The form GO is used to represent self-agentive motion.

(6)   *Unconflated paraphrases of English Motion expressions*

BE$_{LOC}$ + **Manner**

a′. The lamp lay on the table =
    [the lamp WAS$_{LOC}$ on the table] WITH-THE-MANNER-OF
    [the lamp lay there]

b′. The rope hung across the canyon from two hooks =
    [the rope WAS$_{LOC}$ (EXTENDED) across the canyon]
    WITH-THE-MANNER-OF [the rope hung from two hooks]

MOVE + **Manner**

non-agentive

c′. The rock rolled down the hill =
    [the rock MOVED down the hill] WITH-THE-MANNER-OF
    [the rock rolled]

d′. The gate swung shut on its rusty hinges =
    [the gate MOVED shut (= the gate shut)] WITH-THE-
    MANNER-OF [the gate swung on its rusty hinges]

agentive

f′. I bounced the keg into the storeroom =
    [I $_A$MOVED the keg into the storeroom] WITH-THE-
    MANNER-OF [I bounced the keg]

self-agentive

h′. I ran down the stairs =
    [I WENT down the stairs] WITH-THE-MANNER-OF [I ran]

MOVE + **Cause**

non-agentive

j′. The napkin blew off the table =
    [the napkin MOVED off the table] WITH-THE-CAUSE-OF
    [(something) blew on the napkin]

k′. The bone pulled loose from its socket =
    [the bone MOVED loose from its socket] WITH-THE-
    CAUSE-OF [(something) pulled on the bone]

agentive
m′. I kicked the keg into the storeroom =
    [I $_A$MOVED the keg into the storeroom] WITH-THE-
    CAUSE-OF [I kicked the keg]
o′. I chopped the tree down to the ground at the base =
    [I $_A$MOVED the tree down to the ground] WITH-THE-
    CAUSE-OF [I chopped on the tree at the base]

Note that many of the decompositional constructions here may relate more directly to sentences without conflation, which can therefore paraphrase the original conflational sentences, for example:

(7)   c″.   The rock rolled down the hill.
             The rock went down the hill, rolling in the process / the while.
       j″.   The napkin blew off the table.
             The napkin moved off the table from (the wind) blowing on it.
     m″. I kicked the keg into the storeroom.
             I moved the keg into the storeroom by kicking it.

1.1.2   *Properties of Co-event conflation*
1.1.2.1 Two verb usages.   In the above examples, the same verb form appears in the subordinate clause of the unpacked construction as in the single clause of the integrated sentence. On the conflational account put forward here, the former use of the verb form is more basic, and the latter use incorporates this former use, in its particular relation to the Motion event, together with an additional semantic component of Motion. An English-type language will generally have a regular pattern of such 'lexical doublets'.

Thus, in its basic usage the verb *float* refers to the buoyancy relation between an object and a medium, as seen in:

(8)   The craft floated on a cushion of air

Given the subscript '1' to mark this usage, the verb can also appear in a subordinate clause, next to a main clause referring to motion:

(9)   The craft moved into the hangar, floating$_1$ on a cushion of air

But the same verb form has a second usage that includes the idea of motion together with that of buoyancy. The verb in this usage – here marked with the subscript '2' – can appear in a one-clause sentence that is virtually equivalent to the preceding two-clause sentence:

(10)   The craft floated$_2$ into the hangar on a cushion of air

Accordingly, the relationship between the two meanings of *float* can be represented in isolation as

(11)   MOVE WITH-THE-MANNER-OF [floating$_1$] $\rightarrow$ float$_2$ *or* MOVE [floating$_1$]
          (the while)] $\rightarrow$ float$_2$

and can be represented within the larger sentence in the following way:

(12)   The craft <u>MOVED</u> [floating$_1$ (the while)] into the hangar on a
                                    $\downarrow$
          cushion of air   floated$_2$

The same pair of usages can be seen in an agentive verb such as *kick*. In its basic usage, here again marked with the subscript '1', this verb refers to an agent's impacting his/her foot into some object, but presupposes nothing about that object's moving. This is obvious when that object is understood in fact to be fixed in place:

(13)   I kicked$_1$ the wall with my left foot

Again, this verb can be used in a subordinate clause alongside an independent reference to motion, as in (14a). And again, it has a second usage, marked with the subscript '2', that now incorporates this reference to motion, together with the basic meaning of *kick$_1$* in its causal relation to this motion, as seen in (14b):

(14)   a. I $_A$MOVED the ball across the field, by kicking$_1$ it with my left foot
          b. I $_A$MOVED [by kicking$_1$] the ball across the field with my left foot
                          $\downarrow$
                        kicked$_2$

We can note that Mandarin, for one, is of the same typological category as English in that it conflates the Co-event in its verb. But the parallel goes further. It also has the same double usage for a single verb form:

(15)   a. Wǒ yòng   zuó jiǎo tī$_1$ le   yī   xià   qíang
             I   use(-ing) left foot kick PERF one stroke wall
             'I kicked the wall with my left foot'

          b. Wǒ yòng   zuó jiǎo bǎ   qiú tī$_2$ guó   le   cāo-chǎng
             I   use(-ing) left foot D.O. ball kick across PERF field
             'I kicked the ball across the field with my left foot'

1.1.2.2 The lexicalization account.   Certain evidence may support the proposal of two distinctly lexicalized usages for a verb like *float* or *kick*. To begin with, such a verb in its second usage co-occurs with two constituents of certain semantically different types, while the verb in its first usage co-occurs with only one of these constituents. Thus, *float* in (12) occurs with the directional constituent *into the hangar* and the locative constituent *on a cushion of air*. Our interpretation is that the verb conflates within itself two separate concepts, one of motion and one of situated relationship, that, respectively, are in

semantic association with the two constituents. In its first usage, though, *float* lacks an incorporated concept of motion, and so occurs only with the locative constituent. Similarly, *kick* in its second usage may incorporate both a concept of caused motion and a concept of body-part impact that associate, respectively, with a directional constituent (here, *across the field*) and a body-part-naming constituent (*with my left foot*), whereas *kick* in its first usage associates only with the latter type of constituent.[6]

We can further support the idea that the two usages of a verb like *float* each represent two distinct lexicalizations by showing verbs that have only the one or the other of these usages. To illustrate with this verb itself, note that the verbal form *be afloat* can occur in the same semantic and syntactic contexts as $float_1$, but not in those of $float_2$:

(16)   a. The craft $floated_1$ / was afloat on a cushion of air
         b. The craft $floated_2$ / *was afloat into the hangar on a cushion of air

Further, verbs that are otherwise comparable to *float* – and that might have been expected to exhibit its same two usages – in fact have only one or the other of them. Thus, *lie*, as used in (17a), is semantically much like $float_1$ in referring to the support relation between one object and another – rather than buoyancy of an object in a medium, the relationship here is one of a linear object in roughly horizontal contact along its length with a firm undersurface. But it cannot also be used in a motion-incorporating sense like $float_2$, as seen in (17b), which attempts to express the pen's moving down the incline while in lengthwise contact with it. Conversely, *drift* and *glide* only express motion through space, in the way that $float_2$ does, as seen in (18b). They cannot also be used in a non-motion sense, as attempted in (18a).

(17)   a. The pen lay on the plank
         b. *The pen lay quickly down along the incline

(18)   a. *The canoe drifted/glided on that spot of the lake for an hour
         b. The canoe drifted/glided half-way across the lake

Comparably for agentive forms, *throw* is semantically much like $kick_2$ in referring to a distinct motion event caused by a prior body action, as seen in

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[6] This proposed association between a component incorporated in the verb and an external constituent can be lexico-syntactic as well as semantic. For example, in its basic usage, the intransitive verb *choke* in English distinctively requires the preposition *on* in the constituent that names the object that causes obstruction, as in (i) below, unlike in many other languages, which require an instrumental *with*-type preposition. But this lexico-syntactic requirement for *on* is retained in the second usage of *choke* that additionally incorporates a change-of-state concept of 'becoming', as in (ii). Our interpretation is that this second usage derives from the first usage, where the peculiar prepositional requirement is based. These relationships are shown explicitly in (26a).
(i)   He choked on a bone
(ii)   He choked to death on a bone

(20b). But it has no usage parallel to $kick_1$ referring to the body action alone – i.e., to swinging an object around with one's arm without releasing it into a separate path, as seen in (20a). Complementarily, *swing* itself is generally restricted to this latter sense, parallel to $kick_1$, as seen in (19a), but cannot be used in a sentence like that in (19b) to express consequent motion through space.

(19)   a. I swung the ball with my left hand
        b. *I swung the ball across the field with my left hand

(20)   a. *I threw the ball with my left hand without releasing it
        b. I threw the ball across the field with my left hand

All these forms fit – and can further illustrate – the lexicalization formulae of (2) and (3). When plugged into (2), the forms immediately above exhibit not only usage equivalence but also semantic equivalence. Thus, the usage and meaning of *throw* (L_2) is the same as that of *swing* (L_1) when this form is in construction with the largely grammatical sequence (G) *cause to move by . . . -ing* ('throw' = 'cause to move by swinging'). And as for *kick*, this form is seen to possess a range of usages because it can be plugged into *both* sides of formula (2): $kick_2 = $ *cause to move by kicking*$_1$; or, equivalently by formula (3), *kick* (L_3) has usages equalling the usage of *throw* (L_2) taken together with the usage of *swing* (L_1).

Further support for the idea of separate lexicalization for distinct usages comes from historical changes in word meaning. For example, in their traditional use the verbs *hold* and *carry* formed a near-perfect suppletive pair, differing only in that *carry* additionally incorporated a Motion event while *hold* did not:

(21)   *without motion*   *with motion*
        a. I held the box as I lay on   *I held the box to my neighbour's
            the bed   house
        b. *I carried the box as I lay   I carried the box to my neighbour's
            on the bed   house

Currently, though, *carry* in some contexts – those where motion has just occurred or is about to occur – can also be used in a locative sense: *I stood at the front door carrying the box*. Such a partial extension from the original motion usage into the domain of locative usage would seem better handled by an account based on lexicalization than by one based on constructions.

The usage relationships posited here are accorded some psychological reality by data on children's errors. Bowerman (1981) documents a stage in English acquisition where children become 'aware' of motion conflation in verbs and then overextend the pattern. Thus, verbs that in adult English,

idiosyncratically, cannot be used with an incorporated motion meaning become so used by children:

(22)   a. Don't hug me off my chair (= by hugging move me off)
       b. When you get to her [a doll], you catch her off (on a
          merry-go-round with a doll, wants a friend standing nearby to
          remove the doll on the next spin around)
       c. I'll jump that down (about to jump onto a mat floating atop the
          tub of water and force it down to the bottom)

Note that while the *carry* example extended a motion usage to a locative usage, these children's examples have gone in the opposite direction.

In all the preceding, where we have treated the second usage of a verb – the usage that occurs within the more complex single-clause sentence – as a lexicalization of additional components conflated into it, Aske (1989) and Goldberg (1995) treat it as the original simplex verb and treat the additional complexities of the surrounding construction as the source of the additional meanings. Perhaps the evidence adduced above can be largely reconstrued to serve as well for this constructional position. In the end, the important thing is that we correctly identify the semantic components and their interrelationships, whether these are seen as involving lexical conflation or constructions. However, either approach should aim to be consistent in its treatment of any pairing of usages. For example, our lexicalization approach should – and does – treat intransitive *break* and transitive *break* as distinct lexical items, the latter item incorporating the meaning of the former item together with a component of causation. Many of the same arguments adduced for the two usages of verbs like *float* apply as well to verbs like *break*. Thus, transitive *break* has a greater number of internal components that associate with a greater number of arguments in the sentence. Some verbs comparable to *break* occur only in the intransitive usage, like *collapse*, or only in the transitive usage, like *demolish*. Historical change has extended some one-usage verbs to a double usage. And children make the error of extending a one-usage verb into the other usage. Correlatively, a constructionist approach should treat the transitive causative usage of *break* as arising from intransitive *break* in interaction with the structure of the surrounding sentence, since that would parallel its treatment of Motion–Manner verbs like *float*$_2$.

1.1.2.3 Translational and self-contained Motion.   When the motion complex expressed by a sentence can be analysed into a Motion event and a Co-event of Manner, certain further properties can be observed. The Motion event abstracts from the complex the main translational Motion that the Figure exhibits, while the Co-event, if it too involves Motion, abstracts from the complex an event of 'self-contained Motion'. In translational motion, an object's

basic location shifts from one point to another in space. In self-contained Motion, an object keeps its same basic, or 'average', location. Self-contained Motion generally consists of oscillation, rotation, dilation (expansion or contraction), wiggle, local wander, or rest. Thus, the Motion complex expressed by (23a) can be analyzed as in (23b) into a Motion event of pure translation, which the deep verb MOVE uniquely refers to, and a Co-event of Manner that represents an event of oscillatory or rotational self-contained Motion. (And, as seen below, a language like Spanish regularly represents such a Co-event with its own verb in a separate gerundive clause.) These two types of self-contained Motion are represented in isolation by the sentences in (23c).[7]

(23)   a. The ball bounced / rolled down the hall
       b. [the ball MOVED down the hall] WITH-THE-MANNER-OF [the ball bounced / rolled]
       c. The ball bounced up and down on the same floor tile /
          The log rolled over and over in the water

The cognitive correlate of this linguistic phenomenon is that we apparently conceptualize, and perhaps perceive, certain complex motions as a composite of two abstractably distinct schematic patterns of simpler motion. For example, we may conceptualize, and perceive, the complex motion of a ball describing a succession of gradually diminishing parabolic arcs through a hallway as consisting of two superimposed or fused – but otherwise distinct – schematized motions: motion forward along a horizontal straight line and motion iteratively up and down along a vertical straight line. The componential separation of Motion event and Manner Co-event that we have established for the linguistic structure underlying Motion thus reflects this process of separation performed by our cognition.

This analysis of a Motion complex into a main Motion event and a Co-event raises an issue of *conceptual separability*: how cleanly the complex can be partitioned into autonomous component events. The separation can be quite clean, as in partitioning the motion complex in the 'hovercraft' example into a translational schema ([the craft MOVED into the hangar]) and an autonomous component of self-contained Motion of the rest type ([the craft floated on a cushion of air]). Separation is a bit more difficult in the case of the ball bouncing down the hall, since the pure self-contained bouncing motion would take place in a straight vertical line, whereas in the full Motion complex, it has blended with the forward motion to yield a parabolic resultant. Separation is still more difficult

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[7] To be sure, under a finer granularity, self-contained Motion resolves into translational motion. Thus, in the upward phase of its bounce cycle, the ball translates from the floor to a point in mid-air. And in the course of half a rotation, a point on the log translates from one end to the other of an arc. But such local translations cancel each other out within the broader scope of a coarser granularity.

in the case of the ball rolling down the hall, since the component of rotation that one conceptually abstracts out is not wholly independent, but rather must take place in the right direction and at the right speed so as to correlate with the forward translational motion. The separation becomes fully problematic with cases like a canoe gliding across a lake or a book sliding down an incline, since it is not clear what candidate for an autonomous Co-event might be left after one has conceptually subtracted the event of translational motion from gliding or sliding. It might thus be argued that Manner should not be treated as some separate event that bears a relation to some simplified main event, but only as an aspect of a complex event, on the grounds that in reality some putative Manners cannot exist in isolation. Cognitively, however, linguistic structure attests that we at least conceptualize Manner regularly as a separate event.[8]

1.1.3   Extensions of the Co-event conflation pattern

In the languages that have it, the pattern seen so far for Co-event conflation normally applies far beyond the expression of simple Motion. We here consider five such extensions of the pattern. Again, virtually none of these extensions can be expressed as such in languages like Spanish. In the examples that follow, F stands for 'Figure', G for 'Ground', A for 'Agent', (to) AGENT for '(to) cause agentively', $_A$MOVE for 'agentively cause to MOVE', and capital-letter words for deep or mid-level morphemes. The following characterization of such morphemes holds throughout this chapter.

A *deep morpheme* represents a concept that is assumed to be both fundamental and universal in the semantic organization of language. A *mid-level morpheme* represents a particular conceptual complex that consists of a deep-morphemic concept together with certain additional semantic material, and that is recurrent within a particular language, though it is often also to be found in many other languages. A deep or mid-level morpheme represents a single specific meaning that is inferred to function structurally in the semantic organization of a language or of language in general. The precise details of such a meaning – as with the meaning of a surface lexical morpheme – can be progressively more finely determined through linguistic investigation. But the meanings of the deep and mid-level morphemes posited here are all characterized, if only schematically. Lacking overt form, a deep or mid-level morpheme could be represented by any convenient symbol. Our practice has been to use a surface word, written in capitals, that is suggestive of the morpheme's meaning. But it is to be emphasized that deep and mid-level morphemes are entities distinct from, and in principle not to be identified with, the surface words chosen to

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[8]   In a similar way, it is attested by linguistic structure itself – from the fact that certain forms of aspect can be expressed by main verbs, as in *I started* / *continued* / *stopped* / *finished sweeping* – that the 'temporal contour' of a process can be abstracted off from the remainder of the process for conceptualization as a separate process in its own right.

designate them. Thus, below, the mid-level verb GO – which is intended to refer solely to an Agent's volitionally self-propelled motion, apart from any notion of deixis – is not to be identified with the English lexical verb *go*, which typically does incorporate deixis and has a wide range of disparate usages.[9] Comparably, PUT is here intended to designate an Agent's controlledly moving an object through body-part movements but without whole-body translocation. It thus at least covers the range of English *put* (*I put the book in the box*), *take* (*I took the book out of the box*), *pick* (*I picked the book up off the floor*), and *move* (*I moved the book 3 inches to the left*). It is accordingly not to be identified with the English lexical verb *put*.

1.1.3.1 Conflation onto mid-level verbs based on BE$_{LOC}$ or MOVE.

For the first extension, we note that material from the Co-event can conflate not only onto the two deep verbs BE$_{LOC}$ and MOVE (or onto their agentive counterparts), but also onto certain mid-level verbs based on those deep verbs. Three examples of such mid-level verbs that take Co-event conflation are shown in (24), and a number of further examples appear in (25–26).

(24)   *Mid-level verbs that take Co-event conflation*
        a. COVER: [F] BE$_{LOC}$ all-over [G]
              [paint COVERED the rug] WITH-THE-MANNER-OF
              [the paint was in streaks / dots]
           ⇒ Paint streaked/dotted the rug

        b. GIVE: [A$_1$] $_A$MOVE [F] into the GRASP of [A$_2$]
              [I GAVE him another beer] WITH-THE-MANNER-OF
              [I slid the beer]
           ⇒ I slid him another beer

        c. PUT: [A] controlledly $_A$MOVE [F] by limb motion but without body translocation
              [I PUT the hay up onto / down off of the truck]
              WITH-THE-CAUSE-OF [I forked the hay]
           ⇒ I forked the hay up onto / down off of the truck
              (**I forked the hay to my neighbour's house down the block*
              shows that *fork* is based on PUT, not on $_A$MOVE)

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[9] More specifically, GO represents a semantic complex in which an animate entity volitionally and intentionally causes the translocation of its whole body through space via internal (neuromuscular) control or its results (as in driving a vehicle). Within this complex, the object that exhibits the pure translocational concept of the simplex MOVE verb is the body of the animate entity. The distinction between the self-agentive motion of GO and the autonomous motion of MOVE has been rigorously maintained in the author's work, although often disregarded elsewhere. However, it is true that languages represent self-agentive and autonomous motion largely with the same syntactic constructions and often with the same lexical forms, as with the surface English verb *go* in *The plumber / The rain went into the kitchen*.

1.1.3.2 Conflation onto combinations of MOVE with matrix verbs. We have previously seen that the Co-event can conflate with the agentive form of MOVE, which has been represented as $_A$MOVE. This agentive form can be best understood as deriving from the combination of MOVE and a causative matrix verb that can be represented as '(to) AGENT'. Thus, (to) $_A$MOVE derives from (to) AGENT to MOVE. The second extension of the present pattern is that the Co-event can also conflate with combinations of MOVE and matrix verbs other than (to) AGENT, or indeed with nestings of such combinations. These other matrix verbs can include further causative verbs, like '(to) INDUCE' (see section 1.6 for a range of deep causative verbs), or verbs of attempting, like '(to) AIM'. The deep verb INDUCE is intended to represent in its pure and abstracted form the concept of 'caused agency', as described in detail in Talmy (2000b: ch. 6). The deep verb AIM is intended to represent the intention of an Agent to cause some circumstance, where the outcome is moot. The examples in (25) demonstrate a nested succession of such combinations based on the self-agentive verb 'GO' (itself based on MOVE, as just noted above).

(25)   a. GO: [A] AGENT himself [i.e., his whole body, $=$ F] to MOVE
                [the child WENT down the hallway] WITH-THE-
                MANNER-OF [the child hopped]
            $\Rightarrow$ The child hopped down the hallway
                Similarly: I ran into the house

        b. GET: [A$_1$] INDUCE [A$_2$] to GO
            [I GOT him out of his hiding place] WITH-THE-
            CAUSE-OF [I lured / scared him]
            $\Rightarrow$ I lured/scared him out of his hiding place
                Similarly: I talked him down off the ledge
                        I prodded the cattle into the pen
                        They smoked the bear out of its den

        c. URGE: [A$_1$] AIM to GET [A$_2$] $=$ [A$_1$] AIM to INDUCE [A$_2$] to GO
            [I URGED her away from the building] WITH-THE-
            CAUSE-OF [I waved at her]
            $\Rightarrow$ I waved her away from the building
                Similarly: I beckoned him toward me
                        I called him over to us

The (b) and the (c) types of conflation must be distinguished because the (b) type presupposes the occurrence of the motion event, which therefore cannot be denied – *They lured / scared / smoked / prodded / talked him out, *but he didn't budge* – whereas the (c) type, with its incorporated notion of 'aiming/ attempting', only implicates the occurrence of the motion event, which is therefore defeasible – *They waved / beckoned / called him over, but he didn't budge*.

1.1.3.3 Conflation onto metaphorically extended MOVE.   The third exten-
sion of the present pattern is that the Co-event can conflate with metaphoric
extensions of MOVE – which are here represented by the deep verb within
quotes: 'MOVE' – or with mid-level morphemes built on 'MOVE'. One type of
such metaphoric extension is from motion to change of state, the only type we
illustrate here.[10] Some surface constructions for change of state in English are
patterned like motion constructions, so that the form 'MOVE' can be readily
used in their underlying representations (see (26a, d)). To represent change-
of-state constructions with an adjective, though, we use the more suggestive
forms BECOME for the non-agentive and MAKE$_1$ for the agentive (see (26b, e)).
And in some constructions, the change of state pertains to coming into exis-
tence, a semantic complex that we represent with the mid-level verb FORM in
the non-agentive and with the verb MAKE$_2$ in the agentive (see (26c, f)).

(26)   *Motion-like change-of-state constructions*
        non-agentive
        a. 'MOVE': [F] MOVE metaphorically (i.e., change state)
                [he 'MOVED' to death] WITH-THE-CAUSE-OF [he choked
                   on a bone]
            ($\Rightarrow$ (He died from choking on a bone – or:)
            $\Rightarrow$ He choked to death on a bone

        b. BECOME: 'MOVE' in the environment: __Adjective
                [the shirt BECAME dry] WITH-THE-CAUSE-OF
                   [the shirt flapped in the wind]
            ($\Rightarrow$ (The shirt dried from flapping in the wind – or:)
            $\Rightarrow$ The shirt flapped dry in the wind
                   Similarly: The tinman rusted stiff
                               The coat has worn thin in spots
                               The twig froze stuck to the window

        c. FORM: [F] 'MOVE' into EXISTENCE (cf. the phrase *come into*)
           existence)
                [a hole FORMED in the table] WITH-THE-CAUSE-OF
                   [a cigarette burned the table]
            $\Rightarrow$ A hole burned in the table from the cigarette

        agentive
        d. '$_A$MOVE': [A] AGENT [F] to 'MOVE'
                [I '$_A$MOVED' him to death] WITH-THE-CAUSE-OF
                   [I choked him]
            ($\Rightarrow$ (I killed him by choking him – or:)

---

[10] As shown at length in Talmy (2000b: ch. 3), three further metaphoric extensions are from motion
     to 'temporal contouring', to 'action correlating', and to 'realization'.

$\Rightarrow$ I choked him to death
   Similarly: I rocked/sang the baby to sleep

e. $_A$BECOME = MAKE$_1$: '$_A$MOVE' in the environment: _Adjective
   [I MADE$_1$ the fence blue] WITH-THE-CAUSE-OF
      [I painted the fence]
   $\Rightarrow$ I painted the fence blue

f. $_A$FORM = MAKE$_2$: [A] AGENT [F] to 'MOVE' into EXISTENCE
   (cf. the phrase *bring into existence*)
      [I MADE$_2$ the cake out of fresh ingredients]
         WITH-THE-CAUSE-OF [I baked the ingredients]
   $\Rightarrow$ I baked a cake out of fresh ingredients
      Similarly: I knitted a sweater out of spun wool
               I hacked a path through the jungle

1.1.3.4 Conflation across the various relations of the Co-event to the Motion event. The fourth extension of the present pattern is that the relation borne by the Co-event to the constituent with which it conflates need not be limited to that of either Manner or Cause, but can in fact range over a sizable set of alternatives. Selecting from this larger set, (27) shows six of these relations. These are roughly sequenced according to the temporal relationship of the Co-event to the Motion event with which it conflates, beginning with the Co-event taking place beforehand and ending with its occurring afterwards.

In the first-listed relation, 'Precursion', the Co-event directly precedes and is associated with the main Motion event, but does not cause or assist its occurrence – the Motion event would proceed much the same if the Co-event did not occur. In the 'Enablement' relation, the Co-event directly precedes the main Motion event and enables the occurrence of an event that causes the Motion, but does not itself cause this Motion. Thus, in (27b), your reaching to or grabbing the bottle does not cause the bottle to move off the shelf, but enables you to subsequently keep the bottle in your grip, which is the event that does cause the bottle's motion. In the 'Cause' relation, much-discussed earlier, the Co-event either precedes or co-occurs with the main Motion event and is construed as bringing about the occurrence of this Motion – i.e., the Motion event would not take place if the Co-event did not occur. In the 'Manner' relation, also much-discussed, the Co-event co-occurs with the Motion event and is construed as an additional activity that the Figure of the Motion event exhibits that relates or pertains to the Motion but that is distinct from it. The 'Concomitance' relation is like Manner in that in it, the Co-event co-occurs with the main Motion event and is an activity that the Figure of the Motion event additionally exhibits, but here, this activity does not in itself relate or pertain to concurrent Motion and could just as readily take place by itself. Finally, in the 'Subsequence' relation,

the Co-event takes place directly after the main Motion event, and is enabled by, is caused by, or is the purpose of that Motion event. In fact, Subsequence may better be considered a cover term for a small set of such finer relations that will need to be structurally distinguished.[11]

(27)   *Selected relations between Motion event and conflated Co-event*

    a **Precursion**

        [glass MOVED over the food] WITH-THE-PRECURSION-OF [the glass splintered]

        Glass splintered over the food

        [I $_A$MOVED the pepper into the soup] WITH-THE-PRECURSION-OF [I ground the pepper]

        I ground the pepper into the soup

    b **Enablement**

        [could you $_A$MOVE that bottle down off the shelf] WITH-THE-ENABLEMENT-OF [you reach to / grab the bottle]

        Could you reach / grab that bottle down off the shelf?

        [I $_A$MOVED jellybeans into her sack] WITH-THE-ENABLEMENT-OF [I scooped up the jellybeans]

        I scooped jellybeans up into her sack

    c **Cause**

        [the water MOVED down to the midline of the pot] WITH-THE-CAUSE-OF [the water boiled]

        The water boiled down to the midline of the pot

---

[11] As an index of their generality, the different types of Co-event relations are found as well in verbs not based on a Motion event. Purpose, for example, is conflated in the English verbs *wash* and *rinse* (cf. Talmy 2000b: ch. 3). These verbs, beyond referring to certain actions involving the use of liquid, indicate that such actions are undertaken *in order to* remove dirt or soap. Evidence for such an incorporation is that the verbs are virtually unable to appear in contexts that pragmatically conflict with Purpose –

(i)   I washed / rinsed the shirt in tap water / *in dirty ink

– whereas otherwise comparable verbs like *soak* and *flush*, which seem not to express any Purpose beyond the performance of the main action, *can* appear there:

(ii)   I soaked the shirt in dirty ink / I flushed dirty ink through the shirt

Further, Cause and Manner can be conflated as well in verbs that do not participate in the Motion system. For example, the English verb *clench* expresses (in one area of its usage) the curling together of the fingers of a hand specifically caused by internal (neuromotor) activity. No other cause can be compatibly expressed in conjunction with this verb:

(iii)   a. My hand clenched into a fist from a muscle spasm / *from the wind blowing on it
          b. I/*He clenched my hand into a fist

By contrast, *curl up* expresses a main action similar to that of *clench*, but it incorporates no restrictions as to the cause of the action:

(iv)   a. My hand curled up into a fist from a muscle spasm / from the wind blowing on it
         b. I/He curled my hand up into a fist

[I $_A$MOVED the toothpaste out of the tube] WITH-THE-CAUSE-OF
　　[I squeezed on the toothpaste/tube]
I squeezed the toothpaste out of the tube

d **Manner**

[the top MOVED into the box] WITH-THE-MANNER-OF [the top
　　spun]
The top spun into the box
[I $_A$MOVED the mug along the counter] WITH-THE-MANNER-OF
　　[I slid the mug]
I slid the mug along the counter

e **Concomitance**

[she went to the party] WITH-THE-CONCOMITANCE-OF [she
　　wore a green dress]
She wore a green dress to the party
[I WENT past the graveyard] WITH-THE-CONCOMITANCE-OF [I
　　whistled]
I whistled past the graveyard
Similarly: I read comics all the way to New York

f **Subsequence (including: Consequence / Purpose)**

[I will GO down to your office] WITH-THE-SUBSEQUENCE-OF [I
　　will stop at your office]
I'll stop down at your office (on my way out of the building)
[they $_A$MOVED the prisoner into his cell]
　　WITH-THE-SUBSEQUENCE-OF [they locked the cell]
They locked the prisoner into his cell
(with PLACE: [A] PUT [F] TO [G])
[I PLACE the painting down on the table]
　　WITH-THE-SUBSEQUENCE-OF [the painting lay (there)]
I laid the painting down on the table
Similarly: I stood/leaned/hung the painting on the chair /
　　against the door / on the wall

1.1.3.5 Multiple conflation.　The final extension of the present pattern is that
Co-event conflation is not limited to occurring just once within a two-clause
structure, but can in fact take place *n* times within a structure containing $n + 1$
clauses. By one approach, it can be theorized that such a structure arrays these
clauses in a hierarchical embedding, and that conflation occurs successively,
beginning with the lowest pair of related clauses. The examples below, though,
simply present the clauses of these structures in sequence. The first example
below exhibits a triplet of forms, extended beyond the doublets seen earlier.
Thus, the most basic of the forms, *reach*$_1$ refers to extending a limb along its

axis toward an object; *reach*$_2$ refers to moving an object by one's grip on it after having thus reached toward it; and *reach*$_3$ refers to giving the object thus moved and thus reached toward.

(28)   a. [could you GIVE me the flour]
              WITH-THE-ENABLEMENT-OF [you $_A$MOVE the flour
                  down off the shelf,]
              WITH-THE-ENABLEMENT-OF [you reach$_1$ to it with your
                  free hand?]
          $\Rightarrow$ [could you GIVE me the flour,]
              WITH-THE-ENABLEMENT-OF [you reach$_2$ the flour
                  down off that shelf with your free hand?]
          $\Rightarrow$ Could you reach$_3$ me the flour down off that shelf with your
                  free hand?
          Similarly: [I $_A$MOVED a path through the jungle]
              WITH-THE-ENABLEMENT-OF [I FORMED a path
                  ($\Rightarrow$ *out*)]
              WITH-THE-CAUSE-OF [I $_A$MOVED STUFF away]
              WITH-THE-CAUSE-OF [I hacked at the STUFF with my
                  machete]
          $\Rightarrow$ I hacked out a path through the jungle with my machete

          b.   [the prisoner SENT a message to his confederate]
              WITH-THE-MANNER-OF [the prisoner $_A$MOVED the
                  message along the water pipes]
              WITH-THE-ENABMEMENT-OF [the prisoner FORMED
                  the message ($\Rightarrow$ *out*)]
              WITH-THE-CAUSE-OF [the prisoner tapped on the water
                  pipes]
          $\Rightarrow$ The prisoner tapped out a message along the water pipes to his
                  confederate

1.2   *Motion + Path*

In the second typological pattern for the expression of motion, the verb root at once expresses both the fact of Motion and the Path. If a Co-event of Manner or Cause is expressed in the same sentence, it must be as an independent, usually adverbial or gerundive type, constituent. In many languages – for example Spanish – such a constituent can be stylistically awkward, so that information about Manner or Cause is often either established in the surrounding discourse or omitted altogether. In any case, it is not indicated by the main verb root itself. Rather, languages of this type have a whole series of surface verbs that
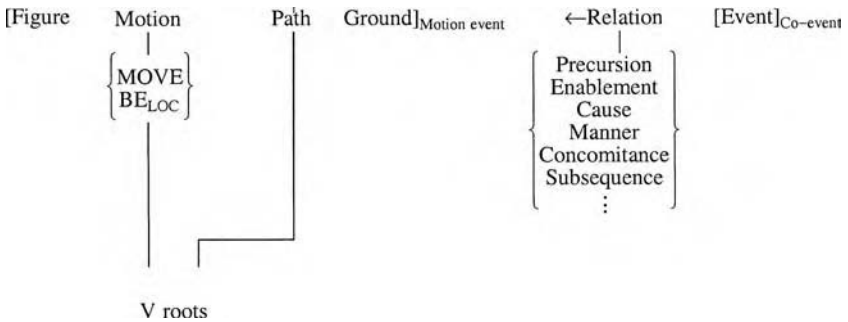
Figure 2.2 Path conflated in the Motion verb

express motion along various paths. This conflation pattern can be represented schematically as in figure 2.2.

Language families or languages that seem to be of this type are Romance, Semitic, Japanese, Korean, Turkish, Tamil, Polynesian, Nez Perce, and Caddo. Spanish is a perfect example of the type. We draw on it for illustration, first with non-agentive sentences, and point out how pervasive the system is here:[12]

(29)   *Spanish expressions of Motion (non-agentive) with conflation of Path*
　　　　a. La botella entró　　　a la　cueva (flotando)
　　　　　 the bottle MOVED-in to the cave　(floating)
　　　　　 'The bottle floated into the cave'

　　　　b. La botella salió　　　 de　la　cueva (flotando)
　　　　　 the bottle MOVED-out from the cave　(floating)
　　　　　 'The bottle floated out of the cave'

　　　　c. La botella pasó　　　 por la piedra (flotando)
　　　　　 the bottle MOVED-by past the rock　(floating)
　　　　　 'The bottle floated past the rock'

　　　　d. La botella pasó　　　　　 por　el tubo (flotando)
　　　　　 the bottle MOVED-through through the pipe (floating)
　　　　　 'The bottle floated through the pipe'

　　　　e. El globo　subió　　 por　 la chimenea (flotando)
　　　　　 the balloon MOVED-up through the chimney　(floating)
　　　　　 'The balloon floated up the chimney'

　　　　f. El globo　bajó　　　　 por　 la chimenea (flotando)
　　　　　 the balloon MOVED-down through the chimney　(floating)
　　　　　 'The balloon floated down the chimney'

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[12] In more colloquial usage, the gerundive *flotando* would generally occur immediately after the verb, but for clarity it is here placed finally – also a possible, if more awkward, location.
　　Whether in a generic or polysemous way, the Spanish preposition *por* covers a range of Path types, each here glossed with its closest distinct English form.

g. La botella se fué   de   la   orilla (flotando)
    the bottle MOVED-away from the bank (floating)
    'The bottle floated away from the bank'

h. La botella volvió   a   la   orilla (flotando)
    the bottle MOVED-back to the bank (floating)
    'The bottle floated back to the bank'

i. La botella le   dió vuelta a la   isla   (flotando)
    the bottle to.it gave turn   to the island (floating)
                            (= 'MOVED around')
    'The bottle floated around the island'

j. La botella cruzó   el canal (flotando)
    the bottle MOVED-across the canal (floating)
    'The bottle floated across the canal'

k. La botella iba   por el canal (flotando)
    the bottle MOVED-along along the canal (floating)
    'The bottle floated along the canal'

l. La botella andaba   en el canal (flotando)
    the bottle MOVED-about in the canal (floating)
    'The bottle floated around the canal'

m. Las dos botellas *se juntaron*   (flotando)
    the two bottles MOVED-together (floating)
    'The two bottles floated together'

n. Las dos botellas *se separaron* (flotando)
    the two bottles MOVED-apart (floating)
    'The two bottles floated apart'

Further Spanish non-agentive verbs that manifest this Path-conflating pattern
are: *avanzar* 'MOVE ahead/forward', *regresar* 'MOVE in the reverse direction',
acercarse 'MOVE closer to (approach)', *llegar* 'MOVE to the point of (arrive at)',
seguir 'MOVE along after (follow)'.

In its agentive forms as well, Spanish shows the same pattern of conflating
Path in the verb. Again, Manner or Cause, if present, is expressed in an indepen-
dent constituent. We can see this for Manner in (30a) and (30b) and for Cause
in (30c) to (30e):

(30) *Spanish expressions of Motion (agentive) with conflation of Path*
    a. Metí   el barril a la   bodega   rodándolo
        I.Amoved.in the keg   to the storeroom rolling.it
        'I rolled the keg into the storeroom'

    b. Saqué   el corcho de la   botella retorciéndolo
        I.Amoved.out the cork   from the bottle twisting.it

Table 2.1 *Spanish 'putting' verbs, differing according to distinctions of Path (A = Agent, F = Figure object, G = Ground object)*

A poner F en G	A put F onto G
A meter F a G	A put F into G
A subir F a G	A put F up (on)to G
A juntar F_1 & F_2	A put F_1 & F_2 together
A quitar F de G	A take F off G
A sacar F de G	A take F out of G
A bajar F de G	A take F down from G
A separar F_1 & F_2	A take F_1 & F_2 apart

or:

Retorcí   el   corcho y   lo saqué   de   la   botella
I.twisted   the cork   and it I.$_A$moved.out from the   bottle
'I twisted the cork out of the bottle'

c. Tumbé el   árbol serruchándolo
   I.felled the tree   sawing-it
   'I sawed the tree down'

d. Tumbé el   árbol a   hachazos / con   una hacha
   I.felled the tree by axe-chops /   with   an   axe
   'I chopped the tree down'

e. Quité   el   papel del   paquete cortándolo
   I.$_A$moved.off the   paper from.the package cutting.it
   'I cut the wrapper off the package'

One category of agentive motion can be represented by the deep verb PUT. In this type, an Agent moves a Figure by the motion of some body part(s) (or an instrument held thereby) in steady contact with the Figure, but without the translocation of the Agent's whole body.[13] As before with simple MOVE, Spanish conflates PUT with different Path notions to yield a series of different verb forms with the separate indication of distinctions of path, as seen in table 2.1.

Notice that English does use different verb forms here, *put* and *take*, in correlation with the general path notions 'to' and 'from' in a way that suggests the Spanish type of Path incorporation. And this may be the best interpretation. But an alternative view is that these are simply suppletive forms of the single more general and non-directional PUT notion, where the specific form that is to appear at the surface is determined completely by the particular Path

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[13] The same semantic complex except with translocation of the Agent's body can be represented by the deep verb CARRY, which underlies the English verbs *carry*, *take*, and *bring*.

particle and/or preposition present. In expressing this notion, English uses *put* in conjunction with a 'to'-type preposition (*I put the dish into/onto the stove*); *take* with a 'from'-type preposition, except when *up* is present (*I took the dish off/out of the stove*); *pick* with a 'from'-type preposition in the presence of *up* (*I picked the dish up off the chair*); and *move* with an 'along'-type preposition (*I moved the dish further down the ledge*).

As further evidence for the interpretation of their purely formal character, these distinctions of verb form are effaced when there is Manner conflation. Thus, beside a different-verb pair of sentences such as *I put the cork into / took the cork out of the bottle* is the same-verb pair *I twisted the cork into / out of the bottle*, where the Manner verb *twist* supplants both *put* and *take*. Comparably, beside *I put the hay up onto / took the hay down off the platform* is *I forked the hay up onto / down off the platform.* Thus, it can be seen that any Path information borne by the English PUT verbs is less than and no different from that expressed by the particles and prepositions occurring in the same sentence and, accordingly, they can be readily supplanted under the Manner conflation typical of English.

On the other hand, the Spanish PUT verbs express the bulk of Path distinctions – the only prepositions used with this subsystem are *a*, *de*, and *en* – and so are central, unsupplanted fixtures in the Spanish sentence, as is typical for *that* language.

English does have a number of verbs that genuinely incorporate Path, as in the Spanish conflation type. Main examples are: *enter*, *exit*, *ascend*, *descend*, *cross*, *pass*, *circle*, *advance*, *proceed*, *approach*, *arrive*, *depart*, *return*, *join*, *separate*, *part*, *rise*, *leave*, *near*, *follow.* And these verbs even call for a Spanish-type pattern for the rest of the sentence. Thus, any Manner notion must be expressed in a separate constituent. For example, a sentence like *The rock slid past our tent* exhibits the basic English pattern with a Manner-incorporating verb and a Path preposition, but the use of a Path-incorporating verb requires that any expression of Manner occur in a separate constituent (where it is rather awkward), as seen in *The rock passed our tent in its slide / in sliding*. But these verbs (and the sentence pattern they call for) are not the most characteristic type in English, and many are not the most colloquial alternatives available. And, significantly, the great majority – here, all but the last four verbs listed – are not even original English forms but rather are borrowings from Romance, where they are the native type. By contrast, German, which has borrowed much less from Romance languages, lacks verb roots that might correspond to most of the Path verbs in the list.

Although Path has so far been treated as a simplex constituent, it is better understood as comprising several structurally distinct components. The three main components for spoken languages are the Vector, the Conformation, and the Deictic (though signed languages may additionally have Contour, Direction, Locus, and Length – see Talmy (2003)).

The Vector comprises the basic types of arrival, traversal, and departure that a Figural schema can execute with respect to a Ground schema. These Vector forms are part of a small set of *Motion–aspect formulae* that are quite possibly universal. These formulae are given in (31), with the Vectors shown as deep prepositions written in capitals.[14] In these formulas, the Figure and the Ground appear as highly abstracted and fundamental schemas. The *fundamental Figure schema* appears first – here, always as 'a point'. A *fundamental Ground schema* – a member of a very small set – follows the Vector. Each formula is exemplified with a sentence whose more specific spatial reference is based on the formula.

(31)   a. A point BE_{LOC} AT a point, for a bounded extent of time
           (The napkin lay on the bed / in the box for three hours)
       b. A point MOVE TO a point, at a point of time
           (The napkin blew onto the bed / into the box at exactly 3.05)
       c. A point MOVE FROM a point, at a point of time
           (The napkin blew off the bed / out of the box at exactly 3.05)
       d. A point MOVE VIA a point, at a point of time
           (The ball rolled across the crack / past the lamp at exactly 3.05)
       e. A point MOVE ALONG an unbounded extent, for a bounded extent of time
           (The ball rolled down the slope / along the ledge / around the tree for ten seconds)
       e´. A point MOVE TOWARD a point, for a bounded extent of time
           (The ball rolled toward the lamp for ten seconds)
       e″. A point MOVE AWAY-FROM a point, for a bounded extent of time
           (The ball rolled away from the lamp for ten seconds)
       f. A point MOVE ALENGTH a bounded extent, in a bounded extent of time.
           (The ball rolled across the rug / through the tube in ten seconds)
           (The ball rolled twenty feet in ten seconds)
       f´. A point MOVE FROM-TO a point-pair, in a bounded extent of time
           (The ball rolled from the lamp to the door / from one side of the rug to the other in ten seconds)
       g. A point MOVE ALONG-TO an extent bounded at a terminating point, at a point of time / in a bounded extent of time
           (The car reached the house at 3.05 / in three hours)

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[14] As with any deep morpheme, the form used to represent a particular deep preposition is not to be identified with any English lexical item. Several of the forms are in fact devised. Thus, ALENGTH is used to represent the basic concept of a path with full span over a bounded extent. Note that it may be necessary to subdivide the Vectors TO and FROM into two types, one involving the concept of a discrete translocation and the other involving the concept of progression along a linear trajectory.

    h.   A point MOVE FROM-ALONG an extent bounded at a beginning
        point, since a point of time / for a bounded extent of time
      (The car has been driving from Chicago since 12.05 / for three
        hours)

The Conformation component of the Path is a geometric complex that relates the fundamental Ground schema within a Motion-aspect formula to the schema for a full Ground object. Each language lexicalizes its own set of such geometric complexes. To illustrate, the fundamental Ground schema in (32a, b, and c) is 'a point'. To this fundamental Ground schema, English can add, for example, the particular Conformation notion: 'which is of the inside of [an enclosure]'. Or it can add another particular Conformation notion: 'which is of the surface of [a volume]'. In each such Conformation, the schema for the full Ground object is indicated in brackets. For felicity, it must be easy to idealize geometrically any full Ground object that is in reference down to this indicated schema – as, say, in referring to a box for 'an enclosure' or a bed for 'a volume'. For the three formulas of (31a, b, c), then, the combination of the Vector and the fundamental Ground schema with these Conformations is as follows:

(32)   a.   AT a point which is of the inside of [an enclosure] = *in*
         [an enclosure]
        AT a point which is of the surface of [a volume] = *on* [a volume]
    b.   TO a point which is of the inside of [an enclosure] = *in(to)*
         [an enclosure]
        TO a point which is of the surface of [a volume] = *on(to)*
         [a volume]
    c.   FROM a point which is of the inside of [an enclosure] = *out of*
         [an enclosure]
        FROM a point which is of the surface of [a volume] = *off (of)*
         [a volume]

The full formulae of (32a,b,c), together with the 'inside' Conformation, are shown in (33a) along with sentences built on the entire complexes. The comparable presentation for the 'surface' comformation appears in (33b).

(33)   a. i.   A point BE$_{LOC}$ AT a point which is of the inside of an
          enclosure for a bounded extent of time
         The ball was in the box for three hours
      ii.   A point MOVE TO a point which is of the inside of an
          enclosure at a point of time
         The ball rolled into the box at exactly 3.05.
      iii. A point MOVE FROM a point which is of the inside of an
          enclosure at a point of time
         The ball rolled out of the box at exactly 3.05

b. i.   A point BE$_{\text{LOC}}$ AT a point which is of the surface of a volume
           for a bounded extent of time
           The napkin lay on the bed for three hours
   ii. A point MOVE TO a point which is of the surface of a volume
           at a point of time
           The napkin blew onto the bed at exactly 3.05
   iii. A point MOVE FROM a point which is of the surface of a
           volume at a point of time
           The napkin blew off of the bed at exactly 3.05

Comparably, the Vector plus the fundamental Ground schema of (31d), 'VIA
a point', can be combined with the Conformation 'which is to one side of [a
point]' to yield *past* (*The ball rolled past the lamp at exactly 3:05*). It can also
be combined with the Conformation 'which is (one of the points) of [a line]'
to yield *across* (*The ball rolled across the crack at exactly 3:05*). And it can be
combined with the Conformation 'which is (one of the points) of [a plane]' to
yield *through* (*The ball sailed through the pane of glass at exactly 3:05*).

In a similar way, the Vector and the fundamental Ground schema of (31e),
'ALONG an unbounded extent', can be combined with the Conformation 'which
is to one side of and parallel to [an unbounded extent]' to yield *alongside*
(*I walked alongside the base of the cliff for an hour*). And the Vector plus
the fundamental Ground schema of (31f), 'ALENGTH a bounded extent', can
be combined with the Conformation 'which is coterminous and coaxial with [a
bounded cylinder]' to yield *through* (*I walked through the tunnel in ten minutes*).

With the Vector and the Conformation components of Path thus distinguished,
we can characterize the Spanish pattern for representing a Motion event more
precisely. The verb root conflates together Motion and the Vector and Confor-
mation components of the Path constituent. The preposition that can occur with
a Ground nominal represents the Vector alone. Thus, in the form 'F *salir de* G',
the verb means 'MOVE FROM a point of the inside (of an enclosure)', while the
preposition simply represents the Vector 'FROM'. Comparably, in the form 'F
pasar por G', the verb means 'MOVE VIA a point that is to one side (of a point)',
while the preposition represents solely the Vector 'VIA'.

In languages that include it in their characteristic representation of Motion
events, the Deictic component of Path typically has only the two member notions
'toward the speaker' and 'in a direction other than toward the speaker'. The
Deictic is thus just a special choice of Vector, Conformation, and Ground object,
not a semantically distinct factor of its own, but its recurrence across languages
earns it structural status. Languages with a Path-conflating verb system can
differ in their treatment of the Deictic. Spanish largely classes its Deictic verbs
(*venir* 'come' and *ir* 'go') together with its 'Conformation verbs' (a term for the
verbs that incorporate Motion + Vector + Conformation) e.g., *entrar* 'enter'.
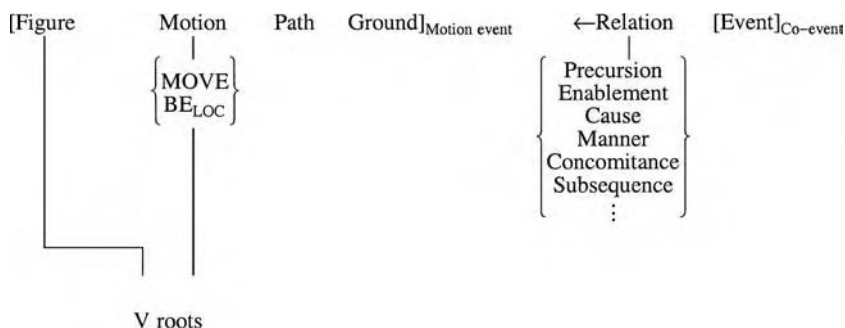
Figure 2.3   Figure conflated in the Motion verb

Thus, in a typical motion sentence, the main verb slot will be occupied by one or the other of these Path verb types, while any gerundive verb form will express Manner.[15]

Like Spanish, Korean can occupy its main verb slot with either type of Path verb, and accompany this with a gerundive Manner constituent. But unlike Spanish, Korean can represent both Path components concurrently. In this case, the Deictic verb is the main verb, the Conformation verb appears in a gerundive constituent, and a Manner verb can still appear in a further gerundive constituent. Thus, Korean is a characteristically Path verb type of language, but it structurally distinguishes the Deictic component from the Conformation component of Path (see Im (2001)).

1.3   *Motion + Figure*

In the third major typological pattern for the expression of Motion, the verb expresses the fact of Motion together with the Figure. Languages with this as their characteristic pattern have a whole series of surface verbs that express various kinds of objects or materials as moving or located. This conflation type can be represented schematically as in figure 2.3.

This pattern can first be illustrated close to home, for English does have a few forms that conform to it. Thus, the non-agentive verb (*to*) *rain* refers to rain moving, and the agentive verb (*to*) *spit* refers to causing spit to move, as seen in (34).

(34)   a. It *rained* in through the bedroom window [non-agentive]
         b. I *spat* into the cuspidor [agentive]

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[15] An exception to this characterization is a somewhat limited construction, exemplified by *Venía / Iba entrando a la casa*, 'He was coming / going into the house'.

But in the languages for which this pattern is characteristic, there are scores of Motion + Figure verbs with the most colloquial and extensive of usages. Atsugewi, a Hokan language of northern California, is an example *par excellence* of this type. The following verb roots are just a sampling:

(35) *Atsugewi verb roots of motion with conflated Figure*
- *-lup-* 'for a small shiny spherical object (e.g. a round candy, an eyeball, a hailstone) to move/be-located'
- *-t'-* 'for a smallish planar object that can be functionally affixed (e.g. a stamp, a clothing patch, a button, a shingle, a cradle's sunshade) to move/be-located'
- *-caq-* 'for a slimy lumpish object (e.g. a toad, a cow dropping) to move/be-located'
- *-swal-* 'for a limp linear object suspended by one end (e.g. a shirt on a clothesline, a hanging dead rabbit, a flaccid penis) to move/be-located'
- *-qput-* 'for loose dry dirt to move/be-located'
- *-staq'-* 'for runny icky material (e.g. mud, manure, rotten tomatoes, guts, chewed gum) to move/be-located'

These verb roots can also have an agentive meaning. For example, *-staq'-* has the further meaning option: '(for an Agent) to move runny icky material'. Thus, such verb roots typically function equally in the expression of events of location, of non-agentive motion, and of agentive motion. Each of these usages is exemplified with *-staq'-* in (36) in referring to guts (an instance of 'runny icky material'). Each example gives both the morphophonemic and the phonetic form (the superscript vowel represents a special morphophoneme of this language; note that an independent nominal for 'guts' could be included along with the verb, thus providing a separate reference to the Figure entity beside the one already provided by the verb root):

(36) *Atsugewi expressions of motion with conflated Figure*
  a. Locative suffix: *-ik·* 'on the ground'
   Cause prefix: *uh-* 'from "gravity" (an object's own weight) acting on it'
   Inflectional affix set: *'- w- -ᵃ* '3rd person subject (factual mood)'
   /'-w-uh-staq'-ík·-ᵃ ⟹ [wostaq'ík·a]
   Literal: 'Runny icky material is located on the ground from its own weight acting on it'
   Instantiated: 'Guts are lying on the ground'

b. Directional suffix: *-ict'*   'into liquid'
    Cause prefix: *ca-*   'from the wind blowing
                                                         on the Figure'
    Inflectional affix set: *'- w- -ᵃ*   '3rd person subject
                                                         (factual mood)'

/'-w-ca-staq-ict-ᵃ/ ⇒   [cwastaqícta]
Literal: 'Runny icky material moved into liquid from the wind
blowing on it'
Instantiated: 'The guts blew into the creek'

c. Directional suffix: *-cis*   'into fire'
    Cause prefix: *cu-*   'from a linear object,
                                                         moving axially, acting on
                                                         the Figure'
    Inflectional affix set: *s-' - w- -ᵃ*   '1sg subject, 3rd person
                                                         object (factual mood)'

/s-'-w-cu-staq-cis-ᵃ/ ⇒   [scustáqcʰa]
Literal: 'I caused it that runny icky material move into fire by
acting on it with a linear object moving axially'
Instantiated: 'I prodded the guts into the fire with a stick'

   Atsugewi's pattern of conflating the Figure with Motion extends to such
Figural objects as body parts and garments. Note that the usual English con-
struction for referring to body-part control involves expressing the body part
as the direct-object nominal of a verb of manoeuvring, as in: *I laid my head
on the pillow / pulled my arm back out of the cage / put my ear against the
wall / stuck my tongue out*. There is only an occasional verb root for body-part
motion which then usually involves additional semantic constraints – e.g. *step*,
'controlledly ₐMOVE one of one's feet while standing on the other', as in: *I
stepped into the puddle / over the crack*. But in Atsugewi, the regular pattern
involves a verb root that refers to a particular body part as moving or located,
and that can take the full range of directional suffixes. Similarly, instead of such
English constructions as *I have a hat on / put my shirt on / took my shoes off
/ put a coat on her*, Atsugewi has verb roots that refer to a particular garment
moved or located for wear that takes affixes indicating whether the garment is
on, or is put on or taken off, oneself or someone else.[16]

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[16] Talmy (2000b: ch. 4) shows that Atsugewi presents a wholly different partitioning of semantic
   space – that one is on a different semantic landscape – from that of, say, familiar European
   languages. For example, Atsugewi wholly lacks verbs of 'object manoeuvring' like English
   hold, *put* (in), *take* (out); *have*, *give* (to), *take* (from); *carry*, *bring* (to), *take* (to); *throw*, *kick*,
   bat (away); *push*, *pull* (along). The components of the semantic material expressed by such
   verbs are in Atsugewi variously omitted, or apportioned out over different constituent types, or
   expressed by the construction.

Table 2.2 *The three typological categories for Motion verbs*

Language / language family	The particular components of a Motion event characteristically represented in the verb root
Romance Semitic Polynesian Nez Perce Caddo Japanese Korean	Motion + Path
Indo-European (not Romance) Chinese Finno-Ugric Ojibwa Warlpiri	Motion + Co-event
Atsugewi (and apparently most northern Hokan) Navajo	Motion + Figure

1.4   A typology for motion verbs

1.4.1   Motion + Co-event, Path, or Figure

The three main conflation patterns for Motion verbs that languages exhibit
are summarized in table 2.2. Subcategorization of these three types, based on
where the remaining components of a Motion event are expressed in a sentence,
is treated later.

1.4.2   Motion + Ground

The typology just presented raises questions about the non-occurring combina-
tory possibilities. It can be seen that one Motion-event component, the Ground,
does not by itself conflate with the Motion verb to form any language's core
system for expressing Motion. Conflations of this sort may not even form any
minor systems.

Sporadic instances of such a conflation do occur, however, and can provide
an idea of what a larger system might be like. The verb root -*plane* in the
English verbs *emplane* and *deplane* can be taken to mean 'move with respect
to an airplane', that is, to specify a particular Ground object plus the fact of
Motion, without any indication of Path. It is the separate prefixal morphemes
here that specify particular Paths. What a full system of this sort would have
to include is the provision for expressing many further Paths and Grounds.
Thus, in addition to the forms just seen with prefixal *em-* and *de-*, we might

expect such a system to contain *circumplane,* 'move around an airplane', and *transplane,* 'move through an airplane'. And there should be many further verb roots participating in this system, say, *(to)-house* 'move with respect to a house' (*I enhoused/dehoused/circumhoused*), and *(to)-liquid*, 'move with respect to liquid' (*The penguin will enliquid/deliquid/transliquid*). But such systems are not to be found.

It is not clear why the Ground component should be so disfavoured. One might first speculate that, in discourse, the Ground object of a situation is the most unvarying component and therefore the one least needing specification. But on further consideration, the Figure would seem to be even more constant – since a discourse often tracks the same Figure object moving progressively with respect to a succession of Ground objects – yet it forms the basis for a major typological system. One might next speculate that the Ground object is the component least salient or accessible to identification. But there seems nothing more obscure about airplanes, houses, and liquids (to pick some likely Ground objects) than, say, about notions of Path, which do form the basis for a major typological system.

Explanation may next be sought in a concept of hierarchy: the different conflation types seem to be ranked in their prevalence among the world's languages, with conflation of Path apparently as the most extensively represented, of Co-event next, and of Figure least so. It may therefore be the case that Ground conflation is also a possibility, but one so unlikely that it has not yet been instantiated in any language that has come to attention. However, while great disparity of prevalence for the different conflation types would be most significant if proved by further investigation, it would then itself require explanation, so that the present mystery would only have moved down a level.

1.4.3   *Motion + two semantic components*

There are further combinatorial possibilities to be considered. Among these is *two* components of a Motion event conflating with Motion in the verb root. Minor systems of such conflation do exist. For example, the Ground *and* Path together are conflated with Motion in a minor system of agentive verbs in English, with forms like *shelve* '$_A$MOVE onto a shelf' (*I shelved the books*) and *box* '$_A$MOVE into a box' (*I boxed the apples*).[17] Another minor system of agentive verbs in English conflates the Figure and Path together with Motion: *powder* '$_A$MOVE facial powder onto' (*She powdered her nose*), *scale* '$_A$MOVE the scales off of' (*I scaled the fish*).

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[17] In English, the particular Paths occurring in this system appear to be virtually limited to the contact-forming 'into/onto' type. Exceptional, thus, are *quarry* '$_A$MOVE out of a quarry', as in *We quarried the granite*, and the verb *mine* with a similar sense, as in *We mined the bauxite*.

Conflation systems of this multi-component sort apparently never form a language's major system for expressing Motion. The reason for such a prohibition seems straightforward for any system that would undertake to make relatively fine semantic distinctions: it would require an enormous lexicon. There would have to be a distinct lexical verb for each fine-grained semantic combination. For example, beside *box* meaning 'put into a box', there would have to be, say, a verb *foo* 'take out of a box', a verb *baz* 'move around a box', etc., and further verbs for the myriad of Ground objects other than a box. Such a system would be infeasible for language, whose organization relies less on large numbers of distinct elements and more on combinatorial devices that operate with a smaller set of elements.

However, one can imagine another kind of multi-component conflational system, one with fairly broad-band references and hence fewer total elements, acting as a kind of classificatory system, that contained verbs with meanings like 'move to a round object', 'move from a round object', 'move through/past a round object', 'move to a linear object', 'move from a linear object', etc. A system such as this would indeed be feasible for language, yet also seems unrealized, and an explanation here, too, must be awaited.

1.4.4   *Motion + no further semantic component*

Another combinatorial possibility is that the verb root expresses the Motion component alone, without the conflation of any other component of the Motion event. This pattern does occur, perhaps with some frequency, in representing the locative type of Motion event. In a language with this arrangement, a single verb form represents the deep verb BE$_{LOC}$, and does not conflate with various Paths, Figures, or Co-events. Spanish has this arrangement: the verb *estar* 'to be located' is followed by various locative prepositions or prepositional complexes that represent the Site, but it does not have a set of distinct verb roots that conflate BE$_{LOC}$ with various SITES to yield such meanings as 'to be in', 'to be on', 'to be under'.[18]

For the representation of the motion type of a Motion event, Atsugewi does in fact have a minor system with a non-conflated verb. A verb root consisting of the vowel *i-* that directly takes any of the Path+Ground suffixes can be interpreted

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[18] It may be a general tendency that languages with Path conflation for motion do not extend this conflation type to the locative and, like Spanish, there employ zero-conflation. But this pattern is not universal. Halkomelem, a Salish language of Canada (Gerdts (1988)) does indeed have a set of verb roots that conflate BE$_{LOC}$ with particular Sites.

And though perhaps rarely forming a characteristic system, the verbal expression of Location + Site is clearly under no prohibitory constraint. English, for one, has a number of incidental instances of such conflation, for example *surround* ('be around'), *top* ('be atop'), *flank* ('be beside'), *adjoin*, *span*, *line*, *fill* – as in *A ditch surrounded the field*, *A cherry topped the dessert*, *Clothing filled the hamper*. It is just that such verbs seldom constitute the colloquial system for locative expression.

as expressing the 'MOVE' notion in isolation. However, this form is not the main way that Motion is expressed in Atsugewi (although it is not fully clear when its use is called for).

If, indeed, the pattern with lack of conflation occurs rarely or never as the main system of a language, one explanation may be its relative inefficiency. The pattern calls for the re-expression of the same morpheme with the same fixed meaning – whether 'MOVE' alone or 'MOVE BE$_{LOC}$' – for every reference to a Motion event. Yet this one fixed meaning can readily be obtained from the other represented components of the Motion event, as is demonstrated by the fact that the previously described major systems for expressing a Motion event in fact lack any morpheme to represent the Motion component alone.

1.4.5   *Motion + a minimally differentiated semantic component*
Certain major systems do exist, however, that, in effect, approach the zero-conflation type. These are systems in which Motion does conflate with another component of the Motion event, but where only two or three distinctions pertaining to that component are represented, rather than a great many distinctions, as we have seen previously.

Thus, Southwest Pomo conflates MOVE with the Figure, but not with that aspect of the Figure that pertains to the type of object or material that it is, as in Atsugewi, but rather with the numerosity of the Figure, and here it marks only three distinctions. Specifically, the Southwest Pomo verb roots -*w*/-*?da*/-*p^{h}il* mean, respectively, 'for one / two or three / several together . . . to move', and these three roots appear recurrently in verbs referring to Motion events. Any representation of the Figure's object type or material characteristics takes place not in the verb root but in the subject nominal.

In a comparable way, it appears that Hindi, in its expression of non-agentive motion, conflates MOVE with Path, but only with the deictic portion of Path, not with the portion that pertains to geometric configurations. And here, only the two-valued 'hither/hence' distinction within deixis is conflated with MOVE so as to yield two verb roots – essentially, 'come' and 'go' – that appear recurrently in constructions representing non-agentive Motion events. The Conformation portion of Path is expressed in a separate Path satellite or prepositional complex.

Finally, in Supalla's (1982) analysis, the main system in American Sign Language (ASL) for representing Motion events has at its core a small set of hand movement types that can be regarded as the counterpart of verb roots. These hand movements represent a component of the Path constituent that does not seem to receive distinct structural recognition as a Path component in any spoken language. This component can be termed the 'Contour', and consists of certain distinctions in the shape of the Path described by a Figure. Supalla distinguishes seven Path Contours in all, and three for cases of actual motion: straight line, curve, and circle.

As the dominant hand moves to trace out a Path-Contour, it may concurrently represent other components of the Path – namely, the Vector, Conformation, Deictic, and Direction of the Path – as well as a certain set of Manners. In addition, the hand's shape concurrently represents the classificatory category of the Figure and, potentially also, certain aspects of an Instrument or Agent. These further semantic representations behave analogously to separate satellite classes accompanying the verb root in a spoken language. The central observation here, though, is that in the main system for representing Motion events in ASL, the verb root equivalent incorporates the Path, as in Spanish, but it incorporates only the Contour component of Path and then marks only three distinctions within that component.

1.4.6   Split system of conflation

So far, we have mostly treated a language in terms of having a characteristic conflation type, sometimes along with some minor systems and occasional forms of a different conflation type. Alternatively, though, a language can characteristically employ one conflation type for one type of Motion event, and characteristically employ a different conflation type for another type of Motion event. This can be called a 'split' or 'complementary' system of conflation.

As suggested earlier, Spanish has such a split system with respect to state of Motion. For a locative situation with an underlying 'BE$_{LOC}$', Spanish characteristically uses the zero-conflation pattern. But for an event of actual motion with an underlying 'MOVE', we have seen Spanish characteristically to use Path conflation.[19] Even within this MOVE type, though, a further split can be seen. Aske (1989) and Slobin and Hoiting (1994) have observed that motion events whose paths are conceptualized as crossing a boundary – as would be typical for 'into' and 'out of' – are the ones that are represented with the Path-conflation pattern. But motion events with a path conceptualized as not crossing a boundary – as would be typical for 'from', 'to', and 'toward' – are characteristically represented with the Co-event-conflation pattern, just like English.

A different split pattern occurs in Emai (Schaefer (1988, 1997)). Emai has an extensive set of Path verbs, much like Spanish, but in a Motion sentence it generally uses this set only for self-agentive motion. It instead uses a main verb with Co-event conflation for non-agentive and agentive motion. It can use this latter conflation type for self-agentive motion as well, if the Manner is other than that of 'walking'.[20]

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[19] English is more consistent than Spanish – that is, has less of a split system than Spanish – in that it extends its pattern of Co-event conflation for Motion events to locative situations as well. This is seen in constructions like *The painting lay on / stood on / leaned against the table*, although, like Spanish, English also has the zero-conflation construction with *be*, as in *The painting was on / against the table*.

[20] In Emai, a path is construed as being either of two main types: a linear progression along a trajectory, or a discrete translocation to or from a point. After a Co-event-conflating main verb,

Tzeltal exhibits yet another split pattern, in fact employing each of the three main conflation types for separate types of Motion event. Like Atsugewi, this language has a large set of verb roots in which the Figure is conflated. These 'positional roots' largely distinguish Figure objects in terms of their disposition: their form, orientation, and arrangement relative to other objects. Unlike Atsugewi, though, when applying them to a Motion event, Tzeltal uses these roots for only one circumstance: where the Figure is or ends up supported at some location. The stative form of the roots refer to a locative situation, having the sense 'for a Figure with X disposition to be at a particular supportive location'. The inchoative form of the roots, the 'assumptive', refers to the arrival at a supportive location of a Figure that has X disposition or that acquires it in the process. And the agentive form of the roots, the 'depositive', refers to an Agent's placing at a supportive location a Figure that has X disposition or that acquires it in the process, where the Agent controls this motion, i.e., holds the Figure with body part or instrument.

In addition, though, like Spanish, Tzeltal has a set of Path-conflating verb roots – the 'movement verbs' – that are used for two further types of Motion event. The non-agentive form of the verbs is used for autonomous Figural motion, thus having the sense '(for a Figure) to MOVE along X Path'. The agentive form of the verbs is used for controlled agentive motion, thus having the sense '(for an Agent) to $_A$MOVE (the Figure) along X Path while holding (it)'.

Finally, like English, Tzeltal uses Co-event-conflating verbs in construction with the 'directional' form of the Path verbs – which here, then, function like Path satellites. This construction covers much the same range of usages as the English construction, e.g. the counterparts of an agentive non-controlled Cause type like *I kicked it in*, of an agentive controlled Cause type like *I carried it in*, of a self-agentive Manner type like *I ran out*, and of a non-agentive Manner type like *It fell down* (though this is the least well-represented type). Although the situations that the last three of these types refer to can largely also be represented by the Path-verb construction, the first type can only be represented by the present construction.[21]

1.4.7   *Parallel system of conflation*
In a split system, a language uses different conflation types for different types of Motion event. But in a parallel system of conflation, a language can use different

the trajectory type of path is represented by one of the Path verbs, now serving as a satellite rather than as a main verb. The translocation type of path is represented by a system of non-verbal locative markers.

[21] Position verbs can also occur in construction with the directionals. For example, the assumptive form of the verb referring to a 'crooked Figure' together with the directional for 'down' can mean 'after falling, for an object that is crooked or that has become crooked in the process to come to rest on a surface'.

conflation types with roughly comparable colloquiality in the representation of the *same* type of Motion event. English would exemplify a parallel-type system if its Path-verb-based constructions were as colloquial as its Co-event-verb-based constructions – for example, if *The bottle exited the cave floating* were as colloquial as *The bottle floated out of the cave*. But this is not the case, so that English has been classed as being characteristically of the Co-event conflation type. On the other hand, Modern Greek does exemplify the parallel system of conflation in using exactly the two types of conflation just cited, with comparable colloquiality, to represent most events of autonomous or self-agentive motion. Thus, for most Path notions, Greek has both a Path satellite for use with a Manner-Cause verb, and a Path verb that can be accompanied by a Manner/Cause gerund. We illustrate this for the Path notion 'in(to)':[22]

(37)　　a.　etreksa　mesa　(s-to　　spiti)
　　　　　　　I.ran　　in　　(to-the　house.ACC)
　　　　　　　'I ran in (-to the house)'

　　　　　b.　bika　　　(trekhondas)　(s-to　　spiti)
　　　　　　　I.entered　(running)　　(to-the　house.ACC)
　　　　　　　'I entered (the house) (running)'

A sampling of parallel Path-satellite and Path-verb constructions in Greek follows, using the notation of section 2.0:

(38)　　　[*se* 'at/to'; *apo* 'from'; V_C = the Co-event verb; V_{MC} = verb
　　　　　conflating MOVE + Co-event]

into	F V_{MC} ◄*mesa* (*se*+ACC> G)	F *beno* (*se*+ACC> G) (V_C-GER)
out (of)	F V_{MC} ◄*ekso* (*apo*+ACC> G)	F *vgheno* (*apo*+ACC> G) (V_C-GER)
up (along)	F V_{MC} ◄*pano* (*se*+ACC> G)	F *anaveno* (*se*+ACC> G) (V_C-GER)
down (along)	F V_{MC} ◄*kato*	F *kataveno* (*apo*+ACC> G) (V_C-GER)
back (to)	F V_{MC} ◄*piso* (*se*+ACC> G)	F *ghirizo* (*se*+ACC> G) (V_C-GER)

1.4.8　Intermixed system of conflation

In principle, a language might exhibit no consistent pattern of conflation for some type of Motion event, but rather intermix different forms of conflation for the various members of that Motion-event type. As will be seen in section 1.7.1, Latin appears to intermix different lexicalization patterns in its expression of change of state. But no language has come to attention in which some characteristic conflation pattern has not emerged for each semantically distinguishable type of Motion event. What such an intermixed system might look like can be readily imagined. Consider that for some Path notions, Greek

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[22] Here and in the other forms, there may tend to be this distinction between the two constructions: the Path verb suggests progression along a trajectory that leads to the Figure's final location, while the Path satellites suggest only its arrival at that final location.
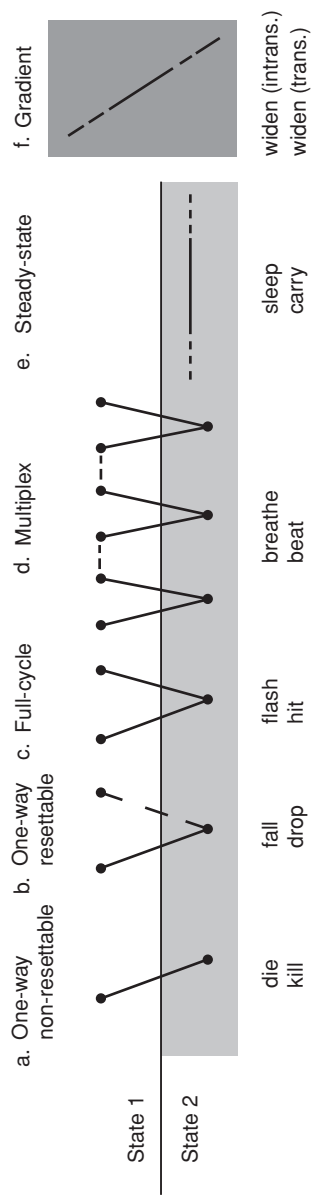
Figure 2.4 Aspectual meanings lexicalized in verb roots

does not have parallel constructions, but either a Path verb or a Path satellite alone. Thus, 'across' and 'past' can be expressed only with Path verbs (*dhiaskhizo* and *perno*), while 'around' can be expressed only with a Path satellite (◄*ghiro*). If the remainder of the Path notions were also expressed by either the one or the other conflation form without any principled semantic basis – instead of the actually occurring pattern of doublets for the majority of the Path notions – then Greek would be an example of an intermixed system of conflation.

1.5   *Aspect*

In addition to the Motion typology we have just seen, languages form a typology according to their characteristic way of expressing (change of) state. This is a domain that involves aspect and causation and their interaction, as addressed in this and the next two sections. 'Aspect' can be characterized as the 'pattern of distribution of action through time'. The term 'action' as used here applies to a static condition – the continuance of a location or state – as well as to motion or change. In figure 2.4 are some of the aspect-types lexicalized in verb roots, with non-agentive and agentive English verbs exemplifying each.

Various grammatical tests demonstrate the distinctness of these types and of the verb roots incorporating them. The resettable type of a one-way verb is distinguished from the non-resettable type by its compatibility with iterative expressions, as in *He fell 3 times*. The non-resettable verbs cannot occur here: **He died 3 times*. This same one-way form is distinguished from a full-cycle form by its ability to occur with expressions of reversal, as in *He fell and then got up*, which the latter cannot do: **The beacon flashed and then went off*. A gradient verb can appear with adverbs of augmentation, as in *The river progressively widened*, unlike a steady-state verb: **She progressively slept*. And so on.

Sometimes all that distinguishes two verb forms which otherwise have the same core meaning is a difference in incorporated aspect. In certain sectors of their usage, this is the case with *learn*, which (for many speakers, though not for all) incorporates a completive aspect, and *study*, which is steady-state. The semantically comparable verb *teach* has a lexicalization range covering both of these aspect-types:

(39) | *completive aspect* | *steady-state aspect* |
|---|---|
| We learned/*studied French | We *learned/studied French |
| in three years | for two years |
| She taught us French | She taught us French |
| in three years | for two years |

Lexicalized aspect figures in the analysis of a language in several ways. First, aspect generally seems to be part of the intrinsic meaning of verb roots.[23] It is doubtful that any verb root can have a meaning wholly neutral to aspect – even in languages where the root is always surrounded by aspect-specifying inflections.

Second, a verb root's intrinsic aspect determines how it interacts with grammatical elements that also have aspectual meaning. Many of the latter appear only with verb roots of a particular aspect-type, operating on them to yield a different aspect-type as a resultant. For example, in English the grammatical form *keep -ing* operates on a one-cycle verb of the (c) type to yield a multiplex aspectual meaning of the (d) type. This shift takes place for *flash* in *The beacon kept flashing*. Similarly, we can make the reverse change from the (d) type to the (c) type with the abstract grammatical form V_{dummy} *a [_ + Deriv]*$_N$ – that is, by using a construction that has the verb root in a derived nominal form. This is what happens to the verb root *breathe* (with an inherent multiplex meaning) in the sentence *She took a breath* (with a 'once only' meaning).[24]

Third, different languages have different patterns of aspect incorporation in their verbs. For example, we will see in section 1.7 how verbs referring to states are lexicalized in some languages with the (b) 'one-way' aspect-type – with the sense of entering into the states – while for the same states other languages will use the (e) 'steady-state' aspect-type. And fourth, verb roots' aspect incorporation can correlate with surrounding factors. For example, it seems generally that a language with a ready inflection indicating 'multiplexity' has few verb roots like English *beat*, *wag*, *flap*, *breathe* with inherent multiplex aspect. Rather, the verb roots by themselves refer to one cycle's worth of the action, and take the inflection to signal multiplexity. One language apparently like this is Hopi (Whorf (1956)), and another is American Sign Language (Elissa Newport (personal communication)).

1.6   Causation

By one analysis, there are quite a few distinct types of causation lexicalized in verbs (see Talmy (2000a: ch. 8)). The number is appreciably greater than the usually recognized two-way distinction between 'non-causative' and 'causative'. Some verbs incorporate only one causation type while others demonstrate a

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[23] This is not to imply that a verb root always has exactly one basic aspect. A verb root can show a certain range of aspects, each manifesting in a different context. Thus, English *kneel* is one-way in *She knelt when the bell rang* and is steady-state in *She knelt there for a minute*.

[24] These two grammatical forms – *keep -ing* and V_{dummy}*a [_ + Deriv]*$_N$ – may be thought to trigger certain cognitive processes. Respectively, these are 'multiplexing' and 'unit-excerpting'. Such processes are discussed in Talmy (2000a: ch. 1).

range of incorporations. A number of such types are listed below, in order of increasing complexity or deviation from the basic (except for the interposed type of (40g)). All but two of these types can be illustrated with the verb *break*. Other verbs are given to illustrate types (h) and (i). Most of these types are here named for the kind of element that acts as the verbal subject.

(40)   *Different types of causative meaning incorporated in the verb root*

a.	The vase broke	– autonomous event (not causative)
b.	The vase broke from a ball's rolling into it	– resulting-event causation
c.	A ball's rolling into it broke the vase	– causing-event causation
d.	A ball broke the vase (in rolling into it)	– instrument causation
e.	I broke the vase in rolling a ball into it (i.e. with result unintended)	– author causation
f.	I broke the vase by rolling a ball into it	– agent causation (i.e. with result intended)
g.	I broke my arm when I fell (= My arm broke [on me] . . .)	– undergoer situation (not causative)
h.	I walked to the store	– self-agentive causation
i.	I sent him to the store	– inducive causation (caused agency)

Previous linguistic treatments (e.g., McCawley (1968)) have represented their incorporated causative element by the capitalized form 'CAUSE'. Since more distinctions are recognized here, more representational forms are needed:[25]

(41)
a.	. . . broke . . .	=	. . . broke . . .
b.	. . . RESULTED-to-break . . .	=	. . . $_R$broke . . .
c.	. . . EVENTed-to-break . . .	=	. . . $_E$broke . . .
d.	. . . INSTRUMENTed-to-break . . .	=	. . . $_I$broke . . .
e.	. . . AUTHORed-to-break . . .	=	. . . $_{Au}$broke . . .
f.	. . . AGENTed-to-break . . .	=	. . . $_A$broke . . .
g.	. . . UNDERWENT-to-break . . .	=	. . . $_U$broke . . .

The autonomous (40a) type presents an event occurring in and of itself, without implying that there is a cause. Such causes as there may be fall outside of attention.[26]

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[25] Our representation of the self-agentive and the inducive types was shown in section 1.1.3.2.

[26] It is not only intransitive sentences that can be autonomous. For example, *An acorn hit the plate* is autonomous. The requirement, rather, is that the sentence must not express a cause (as does *An acorn broke the plate*).

In the (40b) 'resulting-event causation' type, on the other hand, this main event has resulted from another event and would not otherwise have occurred. The causing event can be expressed not only by a full clause, as in (40b) and again in (42a) below, but also by a verb-derived nominal, as in (42b), or by what can be termed an 'action noun', as in (42c). A standard noun as in (42d), however, will not do:

(42)   The window cracked –
    a. from a ball's sailing into it   – nominalized clause
    b. from the pressure/bump of a branch – verb-derived nominal
        against it
    c. from the wind / a fire / the rain   – action noun
    d. *from a ball   – standard noun

The clause-like behaviour of action nouns can be attributed to their being in fact conflations of full clauses. Thus, the examples in (c) might be considered to have internal semantic structures equivalent to the following clauses:

(43)   *wind*: 'air's blowing [on the Figure]'
       rain: 'rainwater's falling [on the Figure]'
       fire: 'flames acting [on the Figure]'

Such semantic conflation, taking place in the noun, exemplifies lexicalization in a grammatical category other than the verb root and the satellite, the ones addressed in this chapter. (For further examples, involving conflation in subordinating and coordinating conjunctions and in certain adverb classes, see Talmy (2000a: ch. 6).)

Perhaps most verbs that are lexicalized to express either the autonomous or the resulting-event type of causation can also express the other type. English verbs whose range includes both these causation types but no others are *die*, *fall*, *drift*, *disappear*, *sleep*. English appears to distinguish these two causation types lexically only in the stative with the verbs *be* and *stay*:

(44)   a. The pen was on the incline (autonomous situation)
    b. The pen *was/stayed on the incline from a lever pressing
       against it (resulting-event causation)

While the (40b) type focusses on the main event as *resulting* from another event, the (40c) 'causing-event' type focusses on the latter (now the subject) as *causing* the main event.[27] And the instrumental (40d) type focuses on just that

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[27] Arguments are given in Talmy (2000a: chs. 6 and 8) as to why the resulting-event (b) form should be considered semantically more basic than the causing-event (c) form.

object within the causing event that actually *impinges* on the affected elements of the resulting event.[28] English has very few verbs that incorporate the (c) or (d) types without also incorporating the (e) and (f) types. One example, though, is *erode* as in *The river's rushing along it | The river | ?*The scientists eroded that section of land*. Further, there may be no verbs that are lexicalized only for the (c) or the (d) type without also being able to express the other type.

In both author (40e) and agent (40f) causation, an animate being wills a bodily action that leads (through a variously sized chain of causal events) to the main event referred to.[29] In the author type, the being intends all these events except the final one; in the agent type, the final one, too, is intended. English verbs associated with the author type and only slightly or not at all with the agentive are *spill*, *drop*, *knock* (*down*), and bi-morphemic *mislay*. Strictly agentive verbs are *murder*, *throw*, *persecute*.

The Undergoer in the (40g) type is like an Author in that he does not intend the event mentioned. But he also has not intentionally undertaken any actions that culminate in that event. Rather, the event is conceived of as occurring independently of the Undergoer, but as affecting his subjective state, usually adversely. Many languages express the Undergoer in an oblique constituent, as does Spanish:

(45)   a. Se me quebró el brazo
            'The arm broke itself [to] me' = 'I broke my arm'
    b. Se me perdió la pluma
            'The pen lost itself [to] me' = 'I lost my pen'

English does have this construction (with *on*: *My arm broke on me*). But it also has verbs that allow the Undergoer as subject, as seen in: *I broke my arm, I caught my sweater on a nail, I developed a wart in my ear*. And English also has verbs that require the Undergoer as subject, like *lose* and *forget*. We can contrast the Agent, Author, and Undergoer types with the three verbs in

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[28] This impinging object is the Figure within the causing event, but it is the Instrument with respect to the overall cause–effect situation. That is, for this author 'Instrument' is not a basic notion, as it is, say, for Fillmore (1968). It is a derived notion, to be characterized in terms of other, more basic notions: the Instrument of a cause–effect sequence is the Figure of the causing event.

[29] The act of will is the first link in the causal chain. Through internal (neuromotor) activity, it brings about the movement of the body. Note that such bodily motion, even when not referred to, is a necessary link for a final physical event. Thus, while *Sue burnt the leaves* only mentions Sue as the initiator and the leaves' burning as the final event, we must infer not only that fire was the immediate Instrument but also that Sue (due to her will) acted physically to marshal it. The typical omission of explicit reference to all the causal subevents in the chain between an initiator and a final subevent are treated at length in Talmy (2000a: ch. 4).

I hid/mislaid/lost my pen somewhere in the kitchen. These verbs all have a similar core meaning, one involving an object's becoming not findable. But each incorporates a different causation type:

(46) $\left\{\begin{array}{l}\text{to AGENT}\\\text{to AUTHOR}\\\text{to UNDERGO}\end{array}\right\}$ that NP become not-findable

$$\text{approx.} = \left\{\begin{array}{l}\text{to } \textit{hide}\\\text{to } \textit{mislay}\\\text{to } \textit{lose}\end{array}\right\} \text{ NP}$$

The self-agentive (40h) type is like the agentive except that the animate being's bodily action is itself the final and relevant event, not just an earlier event in a causal sequence. Often, the whole body is moved through space as a Figure. In their usual usage, the English verbs *go*, *walk*, *run*, *jump*, *trudge*, *recline*, *crouch*, etc., incorporate this type. The verb *roll* can incorporate several different causation types, among them the self-agentive, and so permits a contrastive example:

(47)   a. The log rolled across the field   – autonomous event
        b. The boy rolled the log across the field   – agent causation
        c. The boy rolled across the field on purpose – self-agentive causation

In the inducive (40i) type, something (whether a thing, an event, or another Agent) induces an Agent to carry out an act intentionally.[30] For most inducive verbs, the agentively performed act that is induced is in fact a self-agentive type of act, in particular, an act of 'going'. For example, the verb in *I lured him out of his hiding place* means 'by luring, to INDUCE to GO'. Atypically, *sic/set . . . on*, as in *I sicced/set the dogs on the intruder*, mean 'by issuing directions, to INDUCE to attack', and so refer to a self-agentive act of attacking rather than of going. Some English verbs that incorporate only the inducive type (at least, in one sector of their usage) are: *send*, *drive (off)*, *chase (away)*, *smoke (out)*, *lure*, *attract*, *repel*, *sic . . . on*. The verb *set . . . upon* has a range that permits a contrastive example:[31]

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[30] To describe this more analytically: something acts on a sentient entity, causing within it the intention to carry out an act. The intention in turn leads to its actually carrying out the act, in the usual manner of agency. Thus, the entity is caused to act as an Agent (so that another good term for the 'inducive' is 'caused agency').

[31] A semantic and constructional parallelism can be observed here. Shifting one's attention from an autonomous construction to a homologous agentive construction (as from *The ball rolled away* to *I rolled the ball away*) involves a shift from an intransitive to a transitive, and the semantic addition of agency. Similarly, going from a self-agentive construction to a homologous inducive construction (as from *The horse walked away* to *I walked the horse away*) involves a shift from intransitive to transitive and the addition of a further agency. The following sentences illustrate all four constructions while using the same participants:

(48)   a. The dogs set upon us   – self-agentive causation
           b. He set the dogs upon us – inducive causation (caused agency)

Our method for distinguishing causation types rests on finding verbs that incorporate only one type or that have ranges differing by only one type (or, at least, ranges which overlap in enough different ways). For example, we can try to use each of the verbs *die*, *kill*, *murder* in every one of the causative types listed in (40):

(49)
a. He died/*killed/*murdered yesterday (i.e.: 'He underwent death')
b. He died/*killed/*murdered from a car hitting him
c. A car's hitting him *died/killed/*murdered him
d. A car *died/killed/*murdered him (in hitting him)
e. She unintentionally *died/killed/*murdered him
f. She *died/killed/murdered him in order to be rid of him
g. He *died/*killed/*murdered his plants (i.e.: 'His plants died on him')
h. He *died/*killed/*murdered (i.e.: 'He killed himself by internal will')
i. She *died/*killed/*murdered him (i.e.: 'She induced him to kill [others]')

From (49) we can derive the summary in table 2.3 where we see just the acceptable usages.

The different acceptability patterns here help determine which of the posited causative types are structurally distinguished by language. Thus, we have here established the following: the agentive (f) is a type by itself – it alone accommodates *murder*. And there are at least distinctions between the (a/b) set of types – *die* but not *kill* ranges over these – the (c/d/e) set of types – *kill*'s range minus the agentive (f), which was already isolated – and the (g/h/i) set of types – suiting none of the verbs. We can now seek cases that exhibit distinctions within these clusters of types. As already seen, the (a) and (b) types are distinguished, at least in the stative, by English *be* and *stay*. And we have already seen that the author type of causation (e) is selectively lexicalized in such verbs as *mislay*, thus separating the (e) type from the (c)-(d)-(e) cluster of types. The (g) type can be separated out by the fact that it alone accommodates the verb *lose* (in its 'not findable' sense), as we could demonstrate with an array of sentences

    (i)   inducive: They sent the drunk out of the bar
    (ii)   self-agentive: The drunk went out of the bar
    (iii)   agentive: They threw the drunk out of the bar
    (iv)   autonomous: The drunk sailed out of the bar
    The semantic character of the former relationship seems to get imputed to the latter relationship. Thus, we tend to understand a self-agentive event as occuring in and of itself, and to take the inducer of an inducive event as directly bringing about the final event without the intermediary volition of the actor. This semantic imposition is termed the cognitive process of 'physicalization' in Talmy (2000a: ch. 7), and the backgrounding of the intermediary agent in the inducive is treated at length in Talmy (2000a: ch. 4).

Table 2.3 *Acceptable types of causative usage:*
die, kill, *and* murder

	die	kill	murder
a	✓		
b	✓		
c		✓	
d		✓	
e		✓	
f		✓	✓
g			
h			
i			

like that above. Besides, (g) has already been distinguished from (h) and (i) in that *break* can incorporate it but not the latter two types. These latter two types themselves are distinguished in that only (h) accommodates *trudge* and only (i) accommodates *sic . . . on*. It is, however, quite possible that no verbs distinguish between the (c) and (d) causation types, even cross-linguistically, so that these would have to be merged.

We can establish more conclusively that a verb incorporates a particular causation type by using special test frames. For example, here are two sets of frames that can test for author- and agent-type incorporation in English verbs:

(50)   a. *S author-causative*   b. *S agent-causative*
            S accidentally   S intentionally
            S in (+ Cause clause)   S in order that . . .
            S . . . too . . .   NP intend to S
            may S!   NP$_1$ persuade NP$_2$ to S
                                        S!

When placed in these frames, the verbs *mislay* and *hide* show complementary acceptability patterns. In this way each verb is shown to incorporate the one but not the other of the two causation types tested for:

(51)   a. I accidentally mislaid/*hid my pen somewhere in the kitchen
            I mislaid/*hid the pen in putting it in some obscure place
            May you mislay/*hide your pen!
         b. I intentionally *mislaid/hid my pen somewhere in the kitchen
            I *mislaid/hid the pen so that it would never be seen again
            I intend to *mislay/hide my pen somewhere in the kitchen
            She persuaded me to *mislay/hide my pen
            *Mislay/Hide your pen somewhere in the kitchen!

Table 2.4 *Lexicalized causation types shifted by grammatical elements: (a–e) correspond to (a–e) in (53)*

	autonomous	*agentive*	*self-agentive*	*undergoer*	*inducive*
(a)	V ⟶	make V			
(b)	V ⟶		make REFL V		
(c)	{V or	V} ⟶		have V	
(d)		V ⟶	V REFL		
(e)		{V or	V} ⟶		have V

What might be seen as a problem for this demonstration – the fact that *mislay* is bi-morphemic, with its prefix explicitly expressing unintentionality – can be avoided by replacing the *mislay*/*hide* pair in the demonstration with the pair *spill*/*pour* with largely the same results. This new pair has the additional advantage that it allows illustration of the 'S ... too ...' frame, which *mislay*/*hide* do not easily fit: *I spilled/*poured the milk by opening the spout too wide.*

Note that the same test frames employed in the preceding demonstration can also be used with verbs like *break*, that can incorporate any of a range of causative types, to select out one particular causative reading. For example, *break* is interpretable only as an author-type verb in (52a) and only as an agent type in (b):

(52)   a. I broke the window by pressing against it *too* hard
         b. I broke the window *in order* to let the gas escape

Further evidence that verbs have different causative lexicalizations is that they take different grammatical augments to indicate a shift in causation type. Table 2.4 shows a sample from English of such augments and the shifts they mediate. In (53) each shift is illustrated with a verb that is lexicalized solely in the starting-point causative type and is placed with the relevant grammatical shifters in a clause. Accompanying this, for comparison, is a causatively equivalent clause with an unaugmented verb (in italics) lexicalized solely in the causation type at the end of the shift. Thus, (53a) shows *disappear,* which is solely autonomous (*The stone disappeared* / **The witch disappeared the stone*), rendered agentive by the augment *make*, and thereby equivalent to the unaugmented *obliterate*, which itself is solely agentive (*I obliterated the stone* / **The stone obliterated*):[32]

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[32] Verbs that range over two lexicalization types can be used either with or without a grammatical augment for the *same* meaning. We see this for *hide* over the agentive and self-agentive types, and for *set . . . upon* over the self-agentive and inducive types:
(i)   She hid herself behind the bushes = She hid behind the bushes
(ii)   He had his dogs set upon (i.e. fall upon) us = He set his dogs upon us

(53)   a. The witch made the stone disappear (cf. The witch *obliterated*
                                                      the stone)
        b. He made himself disappear   (cf. He *scrammed*)
        c. You might have your toy sailboat   (cf. You might *lose* your toy
            drift off   sailboat)
            You might have your wallet (get)   (cf. You might *lose* your
            stolen in the crowd   wallet in the crowd)
        d. She dragged herself to work   (cf. She *trudged* to work)
        e. I had the maid go to the store   (cf. I *sent* the maid to the
                                                      store)
            I had the dog attack the stranger   (cf. I *sicced* the dog on the
                                                      stranger)

We can observe causative lexicalization patterns at different levels of lin-
guistic organization. At the level of individual lexical items, a verb's particular
range of lexicalizations can often be explained on the basis of its core meaning
alone. For example, the basic referent of *break* can apply to a person's body
part but not to his whole body (*I broke his arm* / **I broke him*) and, accordingly,
the verb lacks a self-agentive usage (**I broke,* in the sense 'I broke myself / my
body'). Similarly, *erode* resists agentive usage because an agent cannot gener-
ally marshal the instrumentalities of erosion. On the other hand, it seems purely
arbitrary that *poison* has an agentive but not an autonomous usage (*He poisoned
her with toadstools* / **She poisoned after eating toadstools*) while *drown* has
both (*He drowned her* / *She drowned*), or that *conceal* has an agentive but not
a self-agentive usage (*I concealed her* / **She concealed in the bushes*) while
hide has both (*I hid her* / *She hid in the bushes*). But motivated or idiosyn-
cratic, all these lexicalization patterns are associated with particular lexical
items.

There are also patterns operating at the level of a whole semantic category.
For example, virtually all English verbs that refer to death without expressing
its cause (in contrast, for example, to *drown*) observe the basic causative/non-
causative distinction – i.e., are lexicalized for either the non-causative (40a/b)
types or the (40c–e) causative types but not for both. The pattern applies to both
simplex and complex expressions:

(54)   *non-causative*   *causative*
        die   kick off   kill   exterminate
        expire   kick the bucket   slay   off
        decease   bite the dust   dispatch   waste
        perish   give up the ghost   murder   knock/bump off
        croak   meet one's end   liquidate   rub out
        pass away   breathe one's last assassinate   do in
                                           slaughter   do away with

By contrast, almost all English verbs expressing the material disruption of an object – e.g., *break*, *crack*, *snap*, *burst*, *bust*, *smash*, *shatter*, *shred*, *rip*, *tear* – apply equally in both non-causative and causative cases (*The balloon burst / I burst the balloon*). There are not many more exceptions than *collapse*, lacking an agentive usage (**I collapsed the shed*), and *demolish*, lacking the autonomous usage (**The shed demolished*).

Different languages often exhibit different lexicalization patterns for a particular semantic category. For example, verbs referring to states are mostly lexicalized in the autonomous type in Japanese but are mostly agentive in Spanish. Japanese adds an inflection to its verbs to express the corresponding agentive, while Spanish adds its reflexive clitics (here serving not in a 'reflexive' but in a 'de-agentivizing' function) to express the autonomous. We can illustrate these complementary patterns with the verbs for 'open':

(55) Japanese: a. Doa ga   aita
                   door SUBJ open (PAST)
                   'The door opened'

          b. Kare wa   doa   o   aketa
             he   TOP door OBJ open (CAUS.PAST)
             'He opened the door'

      Spanish: c. Abrió   la   puerta
                  he.opened the door
                  'He opened the door'

          d. La puerta se   abrió
             the door   REFL opened
             'The door opened'

Finally, at the broadest scope, some lexicalization patterns affect the whole lexicon of a language. One example is that in Japanese the causing-event (40c) and instrument (40d) causation types are barely represented at all. Thus, verbs otherwise corresponding to our *kill* and *break* cannot be used (without extreme awkwardness) with the causing event or Instrument as subject. To express these constituents, one must use the (40b) resulting-event causation type instead.

1.7   *Interaction of aspect and causation*

Different verb roots incorporate different combinations of aspectual and causative types. One might at first expect a language to have a roughly equal distribution of the combinations over its lexicon and to have grammatical elements that bring about a semantic shift from each such combination to any other. But we find two limiting factors. First, not all aspect–causative

combinations are relevant to every semantic domain. For example, in many languages the semantic domain of 'states' seems to involve only (or mainly) these three aspect–causative types (compare Chafe, 1970)):

(56)   a. being in a state   (stative)
        b. entering into a state (inchoative)
        c. putting into a state   (agentive)

Second, even for such a small set, the relevant verbs in a language generally are not evenly lexicalized over the different types. For example, for the expression of 'states', there are languages in which the verb roots are preponderantly lexicalized in only the (a) or only the (b) or only the (c) type. In other languages, such verb roots show a small range of lexicalizations, either over the (a/b) types or over the (b/c) types. There are also languages in which the same verb root is used equivalently for all three aspect–causative types. Sometimes a language's roots exhibit different patterns for different categories within the 'states' domain. Wherever the verb roots are restricted in their aspect–causative ranges, there are generally grammatical devices for getting to the remaining types. But because of all these limitations, the number of devices required can be quite small.

We first demonstrate these lexicalization patterns for one category of states, that of 'postures': postures or orientations that are assumed by the human body or by objects treated as comparable to the body.[33] We can use English here to illustrate the pattern of lexicalization largely limited to the 'being-in-a-state' type. This is seen in verbs like *lie*, *sit*, *stand*, *lean*, *kneel*, *squat*, *crouch*, *bend*, *bow*, etc.[34] These verbs must generally take on additional elements for the other aspect–causative types to be conveyed. For example, *lie* by itself refers to being in the lying posture. The verb must be augmented by a satellite – yielding the form *lie down* – to signify getting into the posture. And it must be further augmented by an agentive derivation – *lay down* – to refer to putting into the lying posture:[35]

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[33] For these, the three aspect–causative types we have noted for verbs of state have the following particular manifestation: (i) a body or object is in a posture non-causatively, or else an animate being self-agentively maintains its body in the posture; (ii) a body or object comes into a posture non-causatively, or else an animate being self-agentively gets its body into the posture; (iii) an agent puts a body other than its own, or some other object, into a posture.

[34] The stative usage of the last two verbs here may not be immediately obvious. It can be seen in the following:
  (i)   She bent over the rare flower for a full minute
  (ii)   He bowed before his queen for a long minute

[35] The pattern we are concerned with here held better in older forms of English. Thus, the idea of agent derivation for the verb is quite questionable for Modern English. But enough of the pattern remains to serve as illustration and to represent languages that do have such forms clearly. Among these latter are apparently many Uto-Aztecan languages (Wick Miller (personal communication)) and Halkomelem.

(57)   a. She *lay* there all during the programme
        b. She *lay down* there when the programme began
        c. He *laid* her *down* there when the programme began

Unlike English, Japanese is a language where posture verbs are generally lexicalized in the 'getting into a state' type, with the other types derived therefrom. For example, the basic meaning of *tatu* is 'to stand up' (comparable to the English verb *arise*). When this verb is grammatically augmented by the *-te iru* form, whose meaning can be rendered as 'to be (in the state of) having [Ved]', the resultant meaning is 'to be in a standing posture'. And when the verb is augmented by the agentive or by the inducive suffix, yielding the forms *tateru* and *tataseru*, the resultant meanings are 'to put into a standing posture' a thing or a person, respectively; to illustrate:

(58)   a. Boku wa   tatta
           I   TOP arose
           'I stood up'

        b. Boku wa   tatte   ita
           I   TOP having.arisen was
           'I was standing'

        c. Hon   o   tateta
           book OBJ AGENTED.to.arise
           'I stood the book up'

        d. Kodomo o   tataseta
           child   OBJ INDUCED.to.arise
           'I stood the child up'

Exemplifying the third pattern, Spanish lexicalizes posture notions in the agentive 'putting-into-a-state' type, the other types being derived therefrom. For example, the verb *acostar*, is inherently transitive, with the meaning 'to lay (someone) down'. To it must be added the reflexive morpheme, giving *acostarse*, to get the meaning 'to lie down'.[36] And for the steady-state meaning 'to lie', the verb must be suffixed with the past participle ending and put in construction with the verb 'to be' – *estar acostado*:[37]

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[36] This use of the reflexive is a special grammatical device, not a semantically motivated one, because there is no way to construe the normal meaning of the reflexive in this context. Normally, the reflexive entails that exactly what one would do to another, one does to oneself. In the present case, what one does to another is to place one's arms around his/her body, lift, and set down. But that is clearly not what one does with oneself. The movement is accomplished, rather, by internal – i.e., neuromuscular – activity.

[37] The past participle suffix in Spanish generally incorporates a passive meaning (unlike the otherwise comparable Japanese *-te*, which has no voice characteristics). However, the present construction, as in *estaba acostado* – which might be taken literally as 'I was laid-down' – will generally be understood with a non-passive reading, as in the sentence gloss 'I lay (there)'.

Table 2.5 *Lexicalization patterns for verbs of posture*
(V = verb root, SAT = satellite, PP = past participle inflection)

	be in a posture	*get into a posture*	*put into a posture*
English	V ⟶	V + SAT ⟶	V + CAUS + SAT
Japanese	'be' + V + PP ⟵	V ⟶	V + CAUS
Spanish	'be' + V + PP ⟵		V
	V + REFL ⟵		

(59)   a. Acosté   al   niño
          I.laid.down the child
          'I laid the child down'

     b. Me   acosté
          myself I.laid.down
          'I lay down'

     c. Estaba acostado
          I.was   laid.down
          'I lay (there)'

These typological findings can be represented together in a single schematic matrix, as in table 2.5. For each class of language, table 2.5 shows the aspect–causative type of the verb in which postural notions are generally lexicalized, and the patterns by which the other types are derived therefrom.

Other languages have other means for deriving the non-basic aspect–causative types from the favoured one. For example, German is like English in having the stative type as basic for posture notions, as with verbs like *liegen* 'lie' and *sitzen* 'sit'. But it does not derive the inchoative 'getting-into-a-state' type directly from this. Rather, it first derives the agentive 'putting-into-a-state' type, with verbal forms like *legen* and *setzen*. And from this, in the manner of Spanish, it uses the reflexive to get back to the inchoative, with forms like *sich legen* and *sich setzen*. Schematically this is:

(60)   *be in a posture*   *get into a posture*   *put into a posture*
        German: V   ⟶   V + CAUS
                                          V + CAUS + REFL ⟵

In the preceding lexicalization patterns, the verb root incorporated only one aspect–causative type. There are further patterns in which the same verb form serves equally for two types, while grammatical augmentation is required for the third. In one pattern of this sort, the 'being-in-a-state' and the 'getting into-a-state' types are represented by the same lexical form, but an augmented form is used for the 'putting-into-a-state' type. The verb root in a pattern like this may be thought to capture a factor common to the two types it represents, namely, the involvement of only a single participant (note that the unrepresented 'putting-into-a-state' type, requiring an agent, involves two participants). By one analysis, Modern Literary Arabic exemplifies this pattern for posture notions (but see below for an alternative interpretation), as in the following root referring to 'sleeping' or 'lying':

(61)   a. Nām-a   ṭ-ṭifl-u   ʕalā   s-sarīr
          $\left\{ \begin{array}{l} \text{was.lying} \\ \text{lay.down} \end{array} \right\}$ —he the-child-NOM $\left\{ \begin{array}{l} \text{on} \\ \text{onto} \end{array} \right\}$ the-bed
          'The child was lying on the bed'/ 'The child lay down onto
          the bed'

       b. Anam-tu   ṭ-ṭifl-a   ʕalā   s-sarīr
          laid.down-I   the-child-ACC   on(to)   the-bed
          'I laid the child down onto the bed'

In another pattern, the same verb root is used to express both the inchoative 'entering-into-a-state' and the agentive 'putting-into-a-state' types, while a different formulation is required for the stative 'being-in-a-state' type. The common factor captured by the verb with two usages in this pattern would seem to be 'change-of-state'. In familiar languages, there are no apparent instances of this as the predominant pattern for verbs expressing postures. But if we switch here to another category of states, that of 'conditions' (treated further below), the pattern can be exemplified by English. Here, for instance, the verb *freeze* lexicalizes the condition of 'frozenness' together with either the agentive or the inchoative type. For the stative type, however, the grammatical form *be +* past-participle-inflection' must be added, yielding *be frozen*:

(62)   a. The water *was frozen*
       b. The water *froze*
       c. I *froze* the water

The remaining possible two-way pattern – where the verb root would be used for both the stative and the agentive types, but not the inchoative – does not appear to have any realization. One reason for such a gap may be that these two types do not share a factor that is common to them both while absent from the inchoative.

Consideration of these two-way cases next brings us to the pattern where the same verb root is used, without any grammatical augment, for all three aspect–causative types. In fact, this pattern seems to be the one English posture verbs are moving toward in a process of change going on now. Thus, as noted earlier, it is somewhat forced for Modern English to interpret posture verbs as pure statives, with augmentation required for the other aspect–causative types. For one thing, marking of an agentive–nonagentive distinction has in many dialects all but disappeared colloquially, with forms like *lay* or *sit* serving for both meanings. For another, the satellite can often appear in stative usages as well. Thus, the combination of verb + satellite can to a large degree be used equally for all three aspect-causative types:

(63)   a. He lay down / stood up all during the show
        b. He lay down / stood up when the show began
        c. She laid him down / stood him up on the bed

Nevertheless, a distinction in the use of forms does still hold to this extent: the satellite seems somewhat awkward in some stative expressions, for example in *He lay (?down) there for hours*. And the verb without satellite may be somewhat awkward in colloquial speech for the agentive usage: *?She laid/stood the child on the bed*.

This same lexicalization pattern occurs without qualification in English for several individual verbs of other 'state' categories. One clear example is *hide*, a 'position' verb:[38]

(64)

a. He *hid* in the attic for an hour   — being in a position
b. He *hid* in the attic when the sheriff arrived — getting into a position
c. I *hid* him in the attic when the sheriff arrived — putting into a position

We can point to one further lexicalization pattern. Here, the verb root is always accompanied by morphemes with their own aspect-causative meanings, making it difficult to determine whether the verb root itself incorporates any aspect-causative type of its own. Perhaps it does not, and the conclusion to be drawn is that such a verb refers solely to a particular state, abstracted away

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[38] The postures category treated in the preceding is mostly non-relational. One can largely determine a body's configuration by observing it alone. But the 'positions' category is relational. It involves the position assumed by one object with respect to another (especially where the latter provides support). Some position notions that are frequently found lexicalized in verbs across languages are: 'lie on', 'stand on', 'lean against', 'hang from', 'stick out of', 'stick/adhere to', 'float on (surface)', 'float/be suspended in (medium)', 'be lodged in', '(clothes) be on', 'hide/be hidden (from view)' + Location. The postures and positions categories may have no clear boundary between them or may overlap. But these heuristic classes, in some version, do seem to be treated differently in many languages.

from all notions of aspect and causation, and that it requires augmentation for *every* aspect-causative indication. If so, then the morphemes that express this augmentation can themselves exhibit some of the same patterns of incorporation as seen above. In some cases, there would be distinct morphemes for each of the aspect-causative types. In other cases, a single set of elements would serve for some pair of aspect-causative types, with another set for the third. This latter pattern can be exemplified by Atsugewi. Here, a verb root referring to posture is always surrounded by aspect–causation-indicating affixes. And among these, generally, one set serves for both the 'getting-into-a-state' and the 'putting-into-a-state' meanings, while a different set is required for 'being-in-a-state'. This is illustrated in (65).

(65)   a. Verb root: *-it^u-*   'for a linear object to be in /
                                                       move into / move out of / move
                                                       while in a lying posture'[39]
            Directional suffix: *-miċ*   'down onto the ground'
            Inflectional affix set: *s- w- '- -^{a}*   '1sg subject (3rd person object)
                                                       factual mood'
            /s-'-w-it^u-miċ-^{a}/ ⟹   [swìt^{h}míċ]
            'I lay down onto the ground' / 'I laid it down onto the ground'

        b. Verb root: *-it^u-*   as for (a) above
            Locative suffix: *-ak·*   'on the ground'
            Inflectional affix set: *s-'- w- -^{a}*   '1sg subject (3rd person
                                                       object) factual mood'
            /s-'-w-it^u-ak·-^{a}/ ⟹   [swìt·ák·a]
            'I was lying on the ground'

Arabic forms like those cited earlier have an alternative analysis that places them at this point of the exposition. The verb root can be taken to be a consonantal form that – like the Atsugewi root – names the state alone and always takes different interposed vowel sequences as grammatical augmentations. These grammatical elements, then, follow a pattern complementary to that of Atsugewi: one vowel sequence handles both the stative and the inchoative, while another one handles the agentive.

1.7.1   *Consistency of patterns within a language*
Lexicalization patterns for aspect-causative types exhibit different degrees of pervasiveness in a language, first in the degree to which a pattern predominates

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[39] The expansion of the gloss for the verb root in (65a) is 'for a linear object to be in lying posture, to move into a lying posture, or to move while in a lying posture'.

within a semantic category. For example, posture notions in English are largely consistent in their stative lexicalization, with perhaps only inchoative *arise* falling outside this pattern. By contrast, posture notions in Latin show up in verbs of a variety of lexicalization types. Each type of verb employs different means to yield other aspect-causative meanings (e.g., stative *sedere* 'to sit' takes a prefixal satellite to yield the inchoative *considere* 'to sit down', while agentive *inclinare* 'to lean (something) against' takes the reflexive to yield the inchoative *se inclinare* 'to lean (oneself) against'):

(66)   *Stative*   *inchoative*   *agentive*
        stare 'stand'   *surgere*   'stand up'   *ponere*   'lay, set'
        sedere 'sit'   *locare*   'set, lay'
        iacere 'lie'   *inflectere* 'bow, bend'
        cubare 'lie'   *inclinare* 'lean'

Second, a pattern in a language that predominates within one category of a semantic domain may or may not do so *across* the categories. As already seen, English is inconsistent in this way because its posture verbs are generally lexicalized in the stative, while its condition verbs have the two aspect-causative meanings other than stative.

Latin also exhibits different patterns across categories. To show this, we first point out that what has so far been considered the single category of 'conditions' is better understood as comprising two separate categories. One of these is 'independent conditions': conditions that objects are conceived of as occurring in naturally. The other category is that of 'dependent conditions': conditions conceived of as not original for objects, ones that objects must be brought into by external forces. In many languages, independent conditions are frequently lexicalized in adjectives. In Latin they are, too, but they also frequently appear in verbs. Here they are generally lexicalized in the 'being-in-a-state' type, with the other types derived therefrom. Dependent conditions, on the other hand, are generally lexicalized in verbs in the agentive, and these follow the Spanish pattern for derivation (except that instead of the reflexive, the mediopassive inflections are used). A schematic representation is given in table 2.6.

The other languages we have looked at in this section show greater consistency across categories. They have the same lexicalization patterns for their verbs of condition as they do for their verbs of posture. We illustrate this extension of the patterns first for Japanese (67a) and Spanish (67b). Compare (58) and (59) with the following:

(67)   a. Japanese
            (i) Mizu ga   kootte ita
                water SUBJ   frozen be (PAST)
                'The water was frozen'

Table 2.6 *Lexicalization patterns for Latin verbs of condition*
(V = verb root, PP = past participle inflection)

	be in a condition	enter into a condition	put into a condition
Independent	V	V + INCHOATIVE	V + CAUS
Dependent	'be' + V + PP	V + MEDIOPASSIVE	V
Examples			
Independent	*patere*	*patescere*	*patefacere*
	'to be open'	'to open (intr.)'	'to open (tr.)'
Dependent	*fractus esse*	*frangi*	*frangere*
	'to be broken'	'to break (intr.)'	'to break (tr.)'

    (ii) Mizu ga   kootta
            water SUBJ freeze (PAST)
            'The water froze'

    (iii) Mizu o   koorasita
            water OBJ freeze (CAUSE PAST)
            'I froze the water'

  b. Spanish

    (i) El agua estaba helada
        the water was   frozen
        'The water was frozen'

    (ii) El agua se   heló
        the water REFL froze
        'The water froze'

    (iii) Helé el agua
        I-froze the water
        'I froze the water'

Comparably, Arabic verbs referring to conditions are lexicalized like posture verbs, with the stative and the inchoative using the same form. Compare (61) with the following:

(68)   ᶜAmiy-a   ṭ-ṭifl-u
        { was − blind / became − blind }-he the-boy-NOM
        'The boy was/became blind'

        Aᶜmay-tu   ṭ-ṭifl-a
        made.blind-I the-boy-ACC
        'I blinded the boy'

1.7.2   Other aspect-causative types

There are aspect-causative types other than the three listed in (56) that might seem quite relevant to notions of states. These would involve the transition from being in a state to not being in that state. Such a transition could apply to both the non-agentive and the agentive:

(69)   b′. exiting from a state
         c′. removing from a state

However, such types of 'state-departure' seem to be under a universal constraint excluding them from at least one type of lexicalization: a verb root can refer to both state-location and state-entry, but it cannot refer to either of these and also to state-departure. Thus, the Arabic verb form for 'be/become blind' cannot also mean 'cease being blind'. Likewise, the English *hide*, as in *He hid*, can refer to 'being in hiding' or 'going into hiding', but not also to 'coming out of hiding'. Further, by one interpretation, even for a verb root that is lexicalized not for a range of senses but only for a single change-of-state sense, that sense is always state-entry, not state-departure. Thus, by this interpretation, the basic sense of English *die* is not 'leave death' or 'become not alive', but rather 'enter death' or 'become dead' – as is indeed suggested by the fact that this verb is etymologically related not to adjectival or nominal *live* / *life* but to *dead* / *death*.

In addition, state-departure – though not excluded from them – seems quite under-represented among grammatical devices that interact with verb roots. For example, English *hide* cannot be used with departure-indicating satellites or prepositions, either in the postposed location –

(70)   a. *He hid out of the attic = He came out of the attic, where he had been hiding
         b. *I hid him out of the attic = I got him out of the attic, where he had been hiding

– or prefixally:[40]

(71)   a. *He unhid from the attic
         b. *I unhid him from the attic

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[40] English may have a few instances where a lexical item, unlike *hide*, can participate in expressions for all three state relations, including state-departure:
(i)   She *stood* there speaking
(ii)   She *stood up* to speak
(iii)   She *stood down* when she had finished speaking

Comparably, adjectives of condition have ready adjunct verbs or verb-forming affixes to express state-location and state-entry but, in English and many other languages, not state-departure:[41]

(72)   be-in-a-state:
              be sick
         enter-into-a-state: exit-from-a-state:
              get sick   **lose* sick
              sick*en*   **de*sick
         put-into-a-state: remove-from-a-state:
              make (someone) sick **break* (someone) sick
              sick*en* (someone)   **de*sick (someone)

American Sign Language is similarly constrained. Thus, its signs for conditions (like 'sick') can generally be executed with a number of distinct movement patterns indicating different aspects ('be sick', 'be sick for a long time', 'stay sick', 'become sick', 'become thoroughly sick', 'repeatedly become sick', 'be prone to becoming sick', etc.), but state-departure is not among these (*'cease being sick'). The idea must be expressed with a combination of two signs ('be sick' + 'finish').

To be sure, English does have *un-* and *de-*/*dis-* for use with some position and condition verbs (*unload*, *decentralize*). But their use is limited, and it is also largely secondary in that the forms indicate *reversal* of state-entry rather than state-departure directly. Thus, *central* must first add *-ize* indicating state-entry before it can add *de-*; there is no **decentral*.

The distinct treatment that languages accord state-departure as against state-location and state-entry often shows up as well in their adpositional systems expressing Path. For example, the same morpheme expresses 'at' and 'to' but a different one expresses 'from' in French *à/à/de*, Japanese *ni/ni/kara* (though *e* is also used for the 'to' meaning alone), and Atsugewi *-iʔ/-iʔ/-uk·a·*. English exhibits this pattern in some of its prepositional and relative–interrogative forms:

(73)   a. She was *behind* the barn   *Where* was she?
       b. She went *behind* the barn   *Where* did she go?
       c. She came *from behind* the barn *Where* did she come *from*?

It is not clear why there should be this avoidance of expressing state-departure. But in any case, among grammatical elements it is only a tendency, not an absolute. In Atsugewi, verb roots referring to postures and positions (and

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[41] Constructions with *stop* – e.g., *stop being sick* and *stop someone from being sick* – are not counted because, in them, *stop* operates on an already verbal construction with *be*, rather than directly on the adjective *sick* itself.

apparently also conditions) regularly take grammatical elements that indicate state-departure, at least in the agentive. We exemplify this with the verb root used previously in (65):

(74)   a. verb root: *-it^u-*   'for a linear object to be in / move into / move out of / move while in a lying posture'[42]
           directional suffix: *-ič*   'up off something'
           inflectional affix set: *s-'-w- -^{a}*   '1sg subject (3rd person object) factual mood'
           /s-'-w-it^u-ič-^{a}/⇒   [swit · úč]
           'I picked it up off the ground, where it had been lying'

1.8   *Personation*

As a contrast with the earlier section on causation, we introduce here a semantic category that in most previous treatments has been incorrectly merged with that of causativity. For actions of certain types, approximately the same actional content is manifested whether one or two participants are involved. For example, whether John shaves himself or shaves me, the action still involves one hand moving one razor over one face. The only relevant difference here is whether the hand and the face belong to the same body. The distinction here is not one of different causation types. Among causation types, an increase in participants brings along with it an increment in actional content, as in going from the autonomous *The snow melted* to the agentive *John melted the snow*, which indicates an additional action complex on the part of John. Involved here, rather, is a new parameter, one that we will call 'personation', pertaining to the role-structure that is ascribed to an action. An action complex of certain kinds can be taken to manifest either locally, in the body and movements of a single actor (the *monadic* personation type), or distributively, with an actor's body acting on that of a further participant (the *dyadic* personation type).

   A verb root can be lexicalized for just one personation type (either one), taking grammatical augmentation to express the opposite type, or it can range over both types. Languages exhibit different patterns, with a bias toward one or another type of lexicalization. Consider, for example, the category of actions involving the use of hands or handled materials on a body. French, for one language, apparently must lexicalize such actions in the dyadic personation type, as actions performed on a *different* person's body. For the case of action on an actor's *own* body, grammatical derivation must be employed – here, the reflexive:

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[42] See footnote for a full expansion of the gloss for the verb root in (65a).

(75)   a. Je raserai   Jean
          I   will.shave John
          'I will shave John'

       b. Je *me*   raserai
          I   myself   will.shave
          'I will shave'

English, too, has many verbs with this personation-type, for example:

(76)   a. I cut/bandaged/tickled John
       b. I cut/bandaged/tickled $\left\{ \begin{array}{c} \text{myself} \\ {}^*\text{ø} \end{array} \right\}$

   But there is a sizable group of English verbs whose simplest form can – in addition to being used to refer to action on another person's body – also express the Agent acting on his own body. This kind of verb thus has a range of incorporations that includes not only the dyadic personation type, but the monadic type as well:

(77)   a. I shaved   f. I scratched (too hard) / Don't scratch!
       b. I washed   g. I buttoned up
       c. I soaped up   h. I dressed
       d. I bathed   i. I undressed
       e. I showered   j. I changed

As discussed in note 4, there is no reason to assume that these verbs incorporate any *reflexive* meaning in conjunction with some basically other-directed sense. It is quite possible to regard these verbs simply as expressing actions that manifest directly in the actor's own person. In having such a group of forms, English distinguishes itself from French, which must use the reflexive with all the corresponding verb forms (except, as in (78e) and (78j), where the concept is expressed with a verb + noun construction):

(78)   a. se raser
       b. se laver
       c. se savonner
       d. se baigner
       e. . . . (prendre une douche)
       f. se gratter
       g. se boutonner
       h. s'habiller
       i. se déshabiller
       j. . . . (changer de vêtements)

As already noted, English verbs of the type in (77) generally can also express the dyadic personation type (e.g. *I shaved him*), and so cover the range of lexicalization types. But Atsugewi has a group of verbs like those in (77) that refer only to the monadic type. To express the dyadic type, these verbs must add an inflectional element – usually the benefactive suffix *-iray*. With this set of forms, Atsugewi behaves in a way quite complementary to that of French. One example:

(79) a. Cause prefix + Verb root: *-cu-sṗ-aì̇-* 'comb the hair'
          Inflectional affix set: *s-ʾ- w- -ᵃ* '1sg subject'
             /s-ʾ-w-cu-sṗaì̇-ᵃ/⇒ [sċuspáì̇]
          'I combed my hair'

      b. Cause prefix + Verb root: *-cu-sṗaì̇-* 'comb the hair'
          Benefactive suffix: *-iray* 'for another'
          Inflectional affix set: *m- w- -isahk* '1sg subject,
                                              thee – object'
             /m-w-cu-sṗaì̇-iray-isahk/⇒ [mcuspaì̇ ré·sahki]
          'I combed your hair'

American Sign Language appears to lexicalize exclusively in the monadic personation type for referring to a certain class of actions, those that in any way involve the torso. Signs for such actions intrinsically refer to them as a person would perform them on herself. These signs must be augmented by additional gestures (such as a shift in body direction) in order to indicate that the actions are performed on someone else. For example, a signer can assert that she had put on earrings by (among other gestures) bringing her two hands toward her ears. However, to assert that she had put the earrings on her mother (who has been 'set up' at a certain point of nearby space), she cannot simply move her hands outward toward where her mother's ears would be. Rather, she only begins by moving her hands outward, but then shifts her body direction slightly and adopts a distinct facial expression – indicating that her torso is now representing that of her mother – and curves her hands back around, moving them again to her own ears. That is, an additional gestural complex is necessary to indicate that the referent action is to be understood as other-directed.

Note that actions lacking physical contact can also be lexicalized with different personations. For example, the English verb *get* (in the sense of 'go and bring back') is basically monadic, as seen in (80a), but can add a benefactive expression for the dyadic, as in (80b). Complementarily, *serve* is basically dyadic, as in (80d), but can add a reflexive for the monadic type, as in (80c). The reflexive here signals only this change in personation type, for it lacks the literal interpretation it has in *I shaved John* / *I shaved myself*.

(80)   *monadic*   *dyadic*
　　　a. I got some dessert from the   → b. I got some dessert from the
　　　　　kitchen   kitchen for Sue
　　　c. I served myself some dessert ← d. I served (Sue) some dessert
　　　　　from the kitchen   from the kitchen

1.9   Valence

We saw in the sections on causation and personation that patterns in the number
and types of arguments adjoining a verb can form the basis for typologies.
We now see that the same is true for patterns in the salience accorded such
arguments.

1.9.1   General considerations
In conceptualizing an event that involves several different entities in distinct
roles, one is able to direct greater attention to some one of these entities than to
the others or, perhaps, to adopt its actual perspective point. A secondary degree
of attention or perspective-taking, further, can be accorded to some second
entity. Such cognitive forms of focussing in are indicated linguistically by a
variety of devices. One device is to make the focussed element the grammatical
subject – or, for assigning secondary focus to an additional element, to make
that the direct object. (Within the scope of our description, it will suffice to
adopt simple notions of the grammatical relations 'subject' and 'direct object',
and to associate these with the case markings 'nominative' and 'accusative'
in the languages that have these.) Now, a lexical verb that refers to a multi-
roled event can have built-in constraints on its freedom to assign focus. It can
be limited to taking only a particular one of the element types as subject (or
direct object), and so lexicalizes focus on that element type. In other instances,
a single verb can accommodate different element types in the focus position,
and so has a range of lexicalizations. Such focussing properties are here called
the 'valence' of a verb. Traditionally, the term *valence* has been used to refer
(either solely or additionally) to the *number* of distinct element types occurring
in association with a verb. In this chapter, the issue of element number arises
only in the treatment of causation and personation. Valence here is used just for
the particular case assignment(s) that a verb exhibits, given a fixed number of
certain types of elements in association with it.
　　The notion of incorporated valence can be effectively demonstrated where
there are two verbs whose subject limitations together equal the range of subject
possibilities of a third verb. This is the case with *emanate* and *emit* on the one
hand and *radiate* on the other. All three of these verbs refer to roughly the
same event, an event having both a Figure element and a Ground element.
But *emanate* requires the Figure as subject, while *emit* requires the Ground

as subject – as contrasted with *radiate*, which accommodates either. Thus, *emanate* incorporates focus on the Figure (the radiation) and *emit* does this for the Ground (the radiator), while *radiate* can incorporate either focus.

(81)   *Valence properties for* emanate*, emit*, *and* radiate

> *Figure as subject*   *Ground as subject*
> Light emanates from the sun *The sun emanates light
> *Light emits from the sun   The sun emits light
> Light radiates from the sun The sun radiates light

We can demonstrate a similar relationship with an agentive example. *Steal*, *rob*, and *rip off* all refer to the same event and take nominals for the Agent, Figure, and Ground roles.[43] All give the Agent primary focus as subject. But for secondary focus as direct object, *steal* selects the Figure (the possessions) while *rob* selects the Ground (the possessor). *Rip off* accommodates either.

(82)   *Valence properties for* steal*, rob*, *and* rip off

> *Figure as direct object*   *Ground as direct object*
> I stole his money from him   *I stole him of his money
> *I robbed his money from him   I robbed him of his money
> I ripped his money off from him I ripped him off (?of his money)

Some verbs – *suffuse* and *drain* are examples – can accommodate their nominals in either the basic Figure-above-Ground precedence or the inverted Ground-above-Figure precedence in both the non-agentive and the agentive. Under inversion, the Figure acquires one of two 'demotion particles'. It acquires *of* when there is an underlying 'from'-type Path, as with *drain*, and it acquires *with* for other Path types, as with *suffuse* (some languages use different cases for this). Thus, the full array of these two verbs' forms in effect constitutes a paradigm against which other verbs, more limited in one respect or another, can be compared.

(83)
a. *Valence patterns for a non-'from'-type Path (F = Figure, G = Ground, A = Agent)*

	non-agentive	*agentive*
basic precedence:	Perfume (F) suffused through the room (G)	I (A) suffused perfume (F) through the room
inverted precedence:	The room (G) suffused with perfume (F)	I (A) suffused the room (G) with perfume (F)

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[43] For this section, the earlier limitation to single-morpheme verbs has been relaxed. Considered here, thus, are a lexical complex like *rip off* and, later, a morphemically complex verb like *frighten*. This is feasible because valence properties can inhere in morphemic complexes of this sort as well as in single roots.

b. Valence patterns for a 'from'-type Path

	non-agentive	*agentive*
basic precedence:	The blood (F) drained from his veins (G)	I (A) drained the blood (F) from his veins (G)
inverted precedence:	His veins (G) drained of their blood (F)	I (A) drained his veins (G) of their blood (F)

(The word *slowly* can be inserted in the preceding sentences for smoother reading.)

Actually, this paradigm is abridged from a still larger one (see Talmy (1972:301–75)) that distinguishes three Figure–Ground precedence relations: the basic format with Figure above Ground in the case hierarchy, that with Figure demotion alone, and that with Figure demoted and Ground promoted. Perhaps no single verb exhibits all the forms, but a pair of verbs can serve to illustrate (cf. Fillmore (1977); Hook (1983)):

		non-agentive	*agentive*
(84)	*basic precedence:*	The bees swarmed in the garden	I pounded my shoe on the table
	with Figure demoted:	It swarmed with bees in the garden	I pounded with my shoe on the table
	and with Ground promoted:	The garden swarmed with bees	I pounded the table with my shoe

Note that the *with* appearing here as a demotion particle and still marking the Figure becomes the *with* that marks the Instrument when a sentence of the present sort is embedded in a causative matrix (cf. note 29). Thus, the sentence in (a) can be embedded as in (b) to yield (c):

(85)   a. I kicked the ball (G) with my left foot (F)
                [< I kicked my left foot (F) into the ball (G)]
        b. I MOVED the ball (F_2) across the field (G_2)
                by kicking it (G_1) with my left foot (F_1)
        c. I kicked the ball (F) across the field (G) with my left foot $(F_2 \Rightarrow I)$

In the same way as with aspect and causation, a language can have grammatical devices for use with a verb of one valence type in order to express a different type. German has this arrangement for cases of the preceding sort. Its prefix *be-* can indicate a shift in secondary focus from the Figure onto the Ground:

(86)   a. Ich raubte ihm   seine   Tasche
           I   stole   him(DAT) his(ACC) wallet
           'I stole his wallet from him' (Figure as direct object)

b. Ich *be*raubte   ihn   seiner   Tasche
I   SHIFT.stole him(ACC) his(GEN) wallet
'I robbed him of his wallet' (Ground as direct object)[44]

Where a language, as here, has a grammatical device for getting to a particular valence type, it might tend to have relatively few verb roots lexicalized in that type. In fact German appears to have fewer verb roots like English *rob* and *pelt*, roots that intrinsically take the Ground as direct object, using instead its complexes of Figure-taking root plus valence-shifter, like *be-raub(en)* and *be-werf(en)*. The two languages contrast in a similar way in what can be called verbs of giving, this time as to how they indicate focus on (and, hence, the point of view of) the giver or the receiver. Both languages do have cases where the distinction is indicated by distinct verb roots of complementary valence type:

(87)   give   teach   get (in the sense of 'receive') learn
        geben lehren kriegen   lernen

But in other cases, English has two verb roots where German has only one, one lexicalized with focus on the receiver. A prefix *ver-* reverses the perspective to the giver's point of view:

(88)   sell   bequeath   lend
        *ver*kaufen *ver*erben *ver*leihen *ver*borgen
        buy   inherit   borrow
        kaufen   erben   leihen   borgen

This is illustrated in (89).

(89)   a. Ich kaufte das Haus von   ihm
           I   bought the house from him
           'I bought the house from him'

        b. Er *ver*kaufte   mir   das Haus
           he bought(REVERSE) me(DAT) the house
           'He sold me the house'

1.9.2   Valence in verbs of affect

Consider verbs of affect with respect to valence. These verbs generally require either the Stimulus or the Experiencer of an affective event as the subject.

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[44] The final genitive expression here would now be only literary. However, there are other verbs that take a colloquial *mit* phrase containing the Figure:
  (i)   Ich warf faule Apfel auf ihn   Ich *be*warf ihn *mit faulen Apfeln*
         'I threw rotten apples at him'   'I pelted him with rotten apples'
  (ii)   Ich schenkte ihm das Fahrrad   Ich *be*schenkte ihn *mit dem Fahrrad*
         'I "presented" the bicycle to him' 'I "presented" him with the bicycle'

Table 2.7 *Derivational patterns for affect verbs focussed on the Stimulus or the Experiencer*

Stimulus as subject	⇒ Experiencer as subject
It frightens me	I am frightened of it
It pleases me	I am pleased with it
It interests me	I am interested in it
Experiencer as subject	⇒ Stimulus as subject
I fear it	It is fearful to me
I like it	It is likeable to me
I loathe it	It is loathsome to me

Accordingly, they incorporate focus on either the qualities of the Stimulus or the state of the Experiencer. Compare this lexicalization difference in *frighten* and *fear*, which refer to roughly the same affective situation:[45]

(90) a. That frightens me – Stimulus as subject
      b. I fear that   – Experiencer as subject

For verbs lexicalized in either valence type, there are grammatical, or grammatical–derivational, means for getting to the opposite type. Thus, a verb with a Stimulus subject can generally be placed in the construction 'be – V + PP – Preposition' (not a passive: the preposition can be other words than *by*) to bring the Experiencer into subject position. And a verb with an Experiencer subject can often figure in the construction 'be – V + Adjective – to', which places the Stimulus as subject. See Table 2.7.

While possibly all languages have some verbs of each valence type, they differ as to which type predominates. In this respect, English seems to favour lexicalizing the Stimulus as subject. While some of its most colloquial verbs (*like*, *want*) have the Experiencer as subject, the bulk of its vocabulary items for affect focus on the Stimulus,[46] as we see in table 2.8.[47]

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[45] The two valence types here pertain not only to verbs but also to adjectival and larger constructions that express affect. Thus, the expressions italicized below can be used only with the case-frame surround shown for them:

Stimulus as subject	Experiencer as subject
That *is odd to* me	I *am glad about* that
That *is of importance to* me	I *am in fear of* that
That *got the goat of me* → *got my goat*	I *flew off the handle over* that

[46] English used to favour Stimulus-subject even more than it does now, but a number of verbs have shifted their valence type. For example, the affect verbs *rue* and *like* – as well as the sensation verb *hunger* and the cognition verb *think* – used to take the Experiencer as grammatical object but now take it as subject.

[47] These lists avoid verbs that refer more to an affect-related action than to the affect itself. For example, *quake* and *rant* – candidates for the Experiencer-subject group – really refer

Table 2.8 *Affect verbs in English*

Stimulus as subject

please	key up	astonish	annoy	incense	concern
satisfy	turn on	awe	bother	infuriate	trouble
gratify	interest	wow	irk	outrage	distress
comfort	engage	confuse	bug	miff	upset
soothe	captivate	puzzle	vex	put out	disturb
calm	intrigue	perplex	pique	disgruntle	disconcert
charm	fascinate	mystify	peeve	frustrate	unsettle
amuse	beguile	baffle	nettle	chagrin	shake up
cheer	entrance	bewilder	irritate	embarrass	discombobulate
tickle	bewitch	boggle	provoke	abash	frighten
delight	tantalize	stupefy	gall	cow	scare
thrill	matter to	dumbfound	aggravate	shame	alarm
transport	bore	flabbergast	grate on	humiliate	grieve
move	surprise	shock	piss off	disgust	hurt
stir	startle	dismay	exasperate	gross out	pain
arouse	amaze	appall	anger	revolt	torment
excite	astound	horrify	rile	worry	

Experiencer as subject

like	marvel over	want	lust for	abhor	sorrow over
enjoy	wonder at	feel like	crave	deplore	regret
care for	trust	desire	need	anger over	rue
groove on	respect	prefer	covet	fume over	hurt from
fancy	esteem	wish for	envy	seethe over	ache from
relish	admire	hope for	dislike	gloat over	suffer from
love	appreciate	hanker after	resent	distrust	bear
adore	value	hunger for	hate	fear	
delight in	prize	thirst for	detest	dread	
thrill to	cherish	long for	despise	worry about	stand
exult over	revere	yearn for	loathe	grieve over	tolerate

By contrast with English, Atsugewi roots appear to have Experiencer subjects almost exclusively. Virtually every affect-expressing verb (as well as adjective in construction with 'be') elicited in field work was lexicalized with an Experiencer subject. To express a Stimulus subject, these forms take the suffix *-ahẁ*. For one example see table 2.9.[48]

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directly to the subject's overt actions, and only imply his/her accompanying affect of fear or anger. Similarly, *harass* and *placate* – potentially Stimulus-subject verbs – refer more to the activities of an external Agent than to the resultant state of irritation or calm in the Experiencer.

[48] This arrangement applies as well to verbs of sensation. Thus, 'be cold' is lexicalized from the point of view of the Experiencer feeling the sensation. The suffix *-ahẁ* is added for the

Table 2.9 *Derivation of Experiencer-subject verb roots to Stimulus-subject in Atsugewi*

Experiencer as subject

Verb root:	*-lay-*	'to consider as good'
Cause prefix:	*sa-*	'by vision'
Derivational suffix:	*-im*	(no specific meaning: occurs here idiomatically)
Inflectional affix set:	s- '- w- -ᵃ	'1sg subject, 3rd person object'

/s-'-w-sa-lay-im-ᵃ/⇒ [sẅsal·ayíw]
'I find it beautiful'

Derived to; Stimulus as subject

Verb root:	*-lay-*	'to consider as good'
Cause prefix:	*sa-*	'by vision'
Valence-shifting suffix:	*-ahẇ*	'Stimulus is subject'
Inflectional affix set:	'- w- -ᵃ	'3rd person subject'

/' -w-sa-lay-ahẇ-ᵃ/⇒ [ẅsal·ayáhẇa]
'It is beautiful'

It may be that the boundaries of the 'affect' category here are too encompassive or misdrawn for good comparative assessments. There may be smaller categories following more 'natural' divisions that reveal more about semantic organization. For example, a 'desiderative' category might well be separated out by itself: *all* the English verbs of 'wanting' listed in table 2.8 have Experiencer subjects, and this arrangement might be widespread, if not universal. Thus, although colloquial expressions with the opposite valence occur in other languages –

(91)   (a) Yiddish:
             Mir   vilt   zix   esn
             me.to wants self   to.eat
             'I feel like eating'

perspective of the Stimulus object rendering the sensation:

(i)   verb root: *-yi:sḱap-* 'feel cold'
        inflectional affix set: s-'-w- -ᵃ   '1 sg subject (3rd person object)'
                    /s-'-w- yi:sḱap-ᵃ ⇒ [sẅye sḱápʰ]
                        'I am cold (i.e., feel cold)'

(ii)   verb root: *-yi:sḱap-* 'feel cold'
        valence-shifting suffix: *-ahẇ*   'Stimulus is subject'
        inflectional affix set: '- w- -ᵃ   '3rd person subject'
               /' – w- yi:sḱap -ahẇ-ᵃ ⇒ [ẅye sḱapáẇa]
                      'It is cold (i.e., to the touch)'

Table 2.10 *'Cognitive' verbs*

Stimulus as subject		Experiencer as subject				
strike	occur to	know	think	consider	remember	learn
seem to	dawn on	realize	feel	suspect	forget	discover
remind . . . of		believe	doubt	imagine	wonder about	find out

(b) Samoan:

'Ua sau ('iate a'u) le fia 'ia
ASP come (to me) the want (to)eat
'A desire for eating has come on me (I feel like eating)'

– they are derived constructions based on verb roots with *Experiencer* subjects. (However, Kaluli of New Guinea may possibly be a language in which all mental verbs – including those of 'wanting' and 'knowing' – put the Experiencer in the surface case that identifies it as the affected argument (Bambi Schieffelin (personal communication)). Perhaps, too, one should separate out an 'assessment' category for notions like 'esteem', 'value', 'prize'; in table 2.8 the English verbs for these notions again all require Experiencer subjects. We had already separated out a 'cognitive' category for the more intellective mental processes. Verbs of this category were excluded from the affect list above, and again English seems to favour Experiencer as subject for them, as shown in table 2.10.

A single semantic–cognitive principle might account for all these correlations between category of mental event and lexicalization tendency: subjecthood, perhaps because of its frequent association with agency, may tend to confer upon any semantic category expressed in it some initiatory or instigative characteristics. Accordingly, with Stimulus as subject, an external object or event (the stimulus) may be felt to act on an Experiencer so as to engender within him/her a particular mental event. Conversely, with Experiencer as subject, the mental event may be felt to arise autonomously and to direct itself outward toward a selected object. For example, a mental event of 'wanting' might be psychologically experienced across cultures as a self-originating event, and so, by this principle, have a preponderant tendency across languages to correlate with Experiencer subjecthood.

2   Satellites

In section 1, we have examined a connected set of semantic categories that appear lexicalized in an open-class type of surface element, the verb root. Here,

to demonstrate the parallelism and to augment earlier typologies, we will examine roughly the same set of semantic categories, now lexicalized in a closed-class type of surface element. This is an element that has not been generally recognized as such in the linguistic literature. We term it the 'satellite to the verb' – or simply, the 'satellite', abbreviated as 'Sat'. It is the grammatical category of any constituent other than a nominal complement that is in a sister relation to the verb root. It relates to the verb root as a dependent to a head. The satellite, which can be either a bound affix or a free word, is thus intended to encompass all of the following grammatical forms, which traditionally have been largely treated independently of each other: English verb particles, German separable and inseparable verb prefixes, Latin or Russian verb prefixes, Chinese verb complements, Lahu non-head 'versatile verbs' (see Matisoff (1973)), Caddo incorporated nouns, and Atsugewi polysynthetic affixes around the verb root. The set of forms that can function as satellites in a language often overlaps partially, but not wholly, with the set of forms in another grammatical category in that language, generally the category of prepositions, verbs, or nouns. Thus, English satellites overlap with prepositions (but *together*, *apart*, *away*, *back*, and *forth*, for example, serve only as satellites, while *of*, *at*, *from*, and *toward* serve only as prepositions). Mandarin satellites overlap with verb roots. And Caddo satellites overlap with noun roots. One justification for recognizing the satellite as a grammatical category is that it captures an observable commonality, both syntactic and semantic, across all these forms – e.g., its common function across one typological category of languages as the characteristic site in construction with the verb for the expression of Path or, more generally, of the 'core schema' (Talmy 2000b: ch. 3).

There is some indeterminacy as to exactly which kinds of constituents found in construction with a verb root merit satellite designation. Clearest are the forms named earlier, such as English verb particles, Latin verb prefixes, Chinese resultative complements, and the non-inflectional affixes in the Atsugewi polysynthetic verb. Probably also deserving satellite status are such compound-forming verbal adjuncts as the first element in English *(to) test-drive*. Also meriting satellite status are incorporated nouns, like those in the Caddo polysynthetic verb, whereas pronominal clitics like those in French may merit the designation less, and full noun phrases are entirely excluded. It is uncertain what status should be accorded such verb-phrase forms as inflections, an auxiliary, a negative element, a closed-class particle like English *only* or *even*, or a free adverb semantically related to the verb root. It is further not clear whether this indeterminacy is due to the present theory's early stage of development or to a cline-like character for the satellite category.

A verb root together with its satellites forms a constituent in its own right, the 'verb complex', also not generally recognized. It is this constituent as a whole that relates to such other constituents as a direct object noun phrase.

Table 2.11 *Satellites as verb prefixes in German, Latin, and Russian*

	A. German	
	'separable' prefix	*'inseparable' prefix*
satellite:	←entzwei	←zer-
verb complex:	brechen ←entzwei (entzweibrechen)	brechen ←zer- (zerbrechen)
ex. sentence:	Der Tisch brach entzwei	Der Tisch zerbrach
	'The table broke in two'	'The table broke to pieces'
	B. Latin	C. Russian
	prefix	*prefix*
satellite:	←in-	←v-
verb complex:	volare ←in- (involare)	letet' ←v- (vletet')
ex. sentence:	Avis involavit	Ptica vletela
	'The bird flew in'	'The bird flew in'

The satellite is easily illustrated in English. It can take the form of either a free word or an affix (satellites are marked here by the symbol ← that, in effect, 'points' from the satellite to its head, the verb root):

(92)   satellite: ←over   ←mis-
        verb complex: start ←over   fire ←mis-
        example sentence: The record started over   The engine misfired

As many as four such satellites can appear together in a verb complex, as in (93). (Here, *right* – belonging to a morpheme set that also includes *way* and *just* – is semantically dependent on the following satellite as its modifier, but it fills a syntactic slot and behaves phonologically like a prototypical satellite.)

(93)   Come ←right ←back ←down ←out from up in there!
        (said, for example, by a parent to a child in a treehouse)

The term traditionally applied to the above element in English is *verb particle* (see B. Fraser (1976)). The term *satellite* has been introduced in order to capture the commonality between such particles and comparable forms in other languages. Within Indo-European, such forms include the 'separable' and 'inseparable' prefixes of German and the verb prefixes of Latin and Russian as shown in table 2.11.

Another kind of satellite is the second element of a verb compound in Chinese, called by some the 'resultative complement'. Another example is any non-head word in the lengthy verbal sequences typical of Tibeto-Burman languages. In the case of Lahu, Matisoff (1973) has called any such word a 'versatile verb'. A third example is any of the non-inflectional affixes on the verb root in the

Atsugewi 'polysynthetic verb'.[49] We now examine a range of types of semantic material that appear in satellites.

2.1 Path

The satellites in English are mostly involved in the expressions of Path. Generally, the Path is expressed fully by the combination of a satellite and a preposition, as in (94a). But usually the satellite can also appear alone, as in (94b). The ellipsis of the prepositional phrase here generally requires that its nominal be either a deictic or an anaphoric pronoun (i.e., that the Ground object be uniquely identifiable by the hearer):[50]

(94)   a. I ran *out of* the house
        b. (After rifling through the house,) I ran *out* [i.e., . . . of it]

Some symbolism here can help represent the semantic and grammatical situation. The symbol $>$ is placed after a preposition, in effect pointing toward its nominal object. Thus this symbol, together with ←, encloses the full surface expression (the satellite plus preposition) that specifies Path, as illustrated in (95a). For a still finer representation, parentheses are used to mark off the portion that can be optionally omitted, and F and G indicate the locations of the nominals that function as Figure and Ground, as shown in (95b):

(95)   a. ←out of$>$
        b. F . . . ←out (of$>$ G)

English has quite a few Path satellites. Some are presented in the sentences below, here without any final Ground-containing phrase:

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[49] There appears to be a universal tendency toward satellite formation: elements with certain types of meaning tend to leave the locations in a sentence where they perhaps logically belong and move into the verb complex. This tendency, whose extreme expression is polysynthesis, is also regularly evident in smaller degrees. A familiar example is that of quantifier floats. Examples in English are the 'floats' of negative and other emphatic modifiers on nouns that parallel quantifier floats:

(a)   **Not* JOAN hit him ⇒ JOAN did*n't* hit him
(b)   *Even* JOAN hit him ⇒ JOAN *even* hit him
(c)   Joan gave him *only* ONE ⇒ Joan *only* gave him ONE

[50] Some Path expressions generally do not permit omissions of this sort. Such is the case with *into* in the sense of 'collision' and also with *up to* in the sense of 'approach' (although some contexts do allow *up* alone):

(i)   It was too dark to see the tree, so he walked into it (* . . . walked in)
(ii)   When I saw Joan on the corner, I walked up to her (* . . . walked up)
(but acceptable is: *When I saw Joan on the corner, I walked up and said 'Hi'*).

(96)

Path satellites in English

I ran *in*.	He ran *across*.	It flew up_1.
I ran *out*.	He ran *along*.	It flew *down*.
I climbed *on*.	He ran *through*.	I went *above*.
I stepped off_1.	He ran *past/by*.	I went *below*.
He drove off_2.	She came $over_1$.	I ran up_2 (to her).
I stepped *aside*.	It toppled $over_2$.	She followed along *after* (us).
She came *forth*.	She spun $around_1$.	They rolled *apart*.
She walked *away*.	She walked $around_2$.	They slammed *together*.
He went *ahead*.	She walked (all) *about*.	
He came *back*.		

In addition, English has a number of Path satellites that would not be generally recognized as such, i.e., as being in the same semantic category as those of (96):

(97)   *More Path satellites in English*

F . . . ◀loose	(from>G)	The bone pulled loose (from its socket).
F . . . ◀free	(from>G)	The coin melted free (from the ice).
F . . . ◀clear	(of>G)	She swam clear (of the oncoming ship).
F . . . ◀stuck	(to>G)	The twig froze stuck (to the window).
F . . . ◀fast	(to>G)	The glaze baked fast (to the clay).
F . . . ◀un-	(from>G)	The bolt must have unscrewed (from the plate).
F . . . ◀over-	ø >G	The eaves of the roof overhung the garden.
F . . . ◀under-	ø >G	Gold leaf underlay the enamel.
G . . . ◀full	(of> F)	The tub quickly poured full (of hot water).

The languages in most branches of Indo-European have Path systems that are homologous with the one just seen for English. That is, they also use a satellite and a preposition, with the prepositional phrase generally omissible. This is illustrated here for Russian (see Talmy (1975) for an extensive treatment of such forms in this language):

(98)   *Path expressions in Russian*

F . . . ◀*v*- (v + ACC>G)'into'
F . . . ◀*vy*- (*iz* + GEN>G)'out of'
F . . . ◀*pere*- (*čerez* + ACC>G)'across'
F . . . ◀*pod*- (*pod* + ACC>G)'to under'
F . . . ◀*pod*- (*k* + DAT>G)'up to'
F . . . ◀*ob*- (*ob* + ACC>G)'to against'
F . . . ◀*ot*- (*ot* + GEN>G) 'off a way from'
F . . . ◀*na*- (*na* + ACC>G) 'onto'
F . . . ◀*s*- (*s* + GEN>G) 'off of'
F . . . ◀*pro*- (*mimo* + GEN>G) 'past'

F . . .←*za-* (*za* + ACC>G) 'to behind/beyond'
F . . .←*pri-* (*k* + DAT>G) 'into arrival at'
F . . .←*do-* (*do* + GEN>G) 'all the way to'
F . . .←*iz-* (*iz* + GEN>G) '(issuing) forth from'[51]

(99)   a. Ja vbežal (v   dom)
          I   in.ran   (into house(ACC))
          'I ran in(-to the house)'

       b. Ja vybežal (iz   doma)
          I   out.ran (out.of house(GEN))
          'I ran out (of the house)'

We want to emphasize for all these Path examples that satellites should be well distinguished from prepositions. No confusion can occur in most Indo-European languages, where the two forms have quite distinct positional and grammatical characteristics. For example, in Latin, Classical Greek, and Russian (see (98) and (99)), the satellite is bound prefixally to the verb while the preposition accompanies the noun (wherever it turns up in the sentence) and governs its case. Even where a satellite and a preposition with the same phonetic shape are both used together in a sentence to express a particular Path notion – as often happens in Latin, Greek, and Russian (again, see (98) and (99)) – the two occurrences are still formally distinct. However, a problem arises for English which, perhaps alone among Indo-European languages, has come to regularly position satellite and preposition next to each other in a sentence. Nevertheless, there are still ways in which the two kinds of forms – satellites and prepositions – distinguish themselves.

To begin with, the two classes of forms do not have identical memberships: there are forms with only one function or the other. Thus, as already noted, *together*, *apart*, *away*, *back*, and *forth* are satellites that never act as prepositions, while *of*, *at*, *from*, and *toward* are prepositions that never act as satellites.[52]

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[51] When they do not take a Path satellite, Russian verbs of motion exist in pairs of distinct forms, traditionally termed the 'determinate' form and the 'indeterminate' form. Examples of such paired forms are *idti*/*xodit'* 'walk', *yexat'*/*yezdit'* 'drive', and *bežat'*/*begat'* 'run'. Semantically, each form of a pair has a cluster of usages distinct from that of the other form. But it may be adjudged that the main semantic tendency of the determinate cluster is comparable to the meaning of the English satellite *along*, as in *I walked along*, and that the main semantic tendency of the indeterminate form is comparable to the meaning of the English satellite *about* (in the sense of 'all about' or 'all around'), as in *I walked about*. It can also be observed that the set of prefixal Path satellites in Russian lacks forms semantically comparable to these two English satellites. Accordingly, one interpretation of the motion verb pairs in Russian is that they represent the conflation of a deep MOVE or GO verb with a deep satellite ALONG or ABOUT (as well as with a Manner event). Such verb pairs are thus, in effect, suppletive extensions of the prefixal Path satellites.

[52] There is some dialectal variation. For example, *with* is only a preposition in some dialects, but in others it is also a satellite, as in *Can I come with?* or *I'll take it with.*

Furthermore, forms serving in both functions often have different senses in each. Thus, *to* as a preposition (*I went to the store*) is different from *to* as a satellite (*I came to*), and satellite *over* in its sense of 'rotation around a horizontal axis' (*It fell/toppled/turned/flipped over*) does not have a close semantic counterpart in prepositional *over* with its 'above' or 'covering' senses (*over the treetop*, *over the wall*).

Next, there are differences in properties. First, with regard to phrase structure and co-occurrence, a satellite is in construction with the verb, while a preposition is in construction with an object nominal. Consistent with this fact, when a Ground nominal is omitted – as it generally may be when its referent is known or inferable – the preposition that would have appeared with that nominal is also omitted, while the satellite remains. Consider, for example, the sentence *He was sitting in his room and then suddenly ran out (of it)*. If the *it* is omitted, the preposition *of* that is in construction with it must also be omitted. But the satellite *out*, which is in construction with the verb *ran*, stays in place. Moreover, a sentence can contain a satellite in construction with the verb with no notion of any object nominal, even an omitted one, as in *The log burned up*. But a preposition always involves some object nominal – though this might have been moved or omitted, as in: *This bed was slept in*, or *This bed is good to sleep in*.

Second, with regard to positional properties, a preposition precedes its nominal (unless this has been moved or omitted), as in (100a). But a free satellite (i.e., one not prefixal to the verb) has these more complex characteristics: it precedes a preposition if one is present, as in (100b). It either precedes or follows a full NP that lacks a preposition, as in (100c), though it tends to follow the NP if that location places it directly before a subsequent preposition, as in (100d). And it must follow a pronominal NP that lacks a preposition, as in (100e).

(100)   a. I ran from the house / it
        b. I ran away from the house / it
        c. I dragged away the trash / I dragged the trash away
        d. ?I dragged away the trash from the house / I dragged the trash away from the house
        e. *I dragged away it (from the house) / I dragged it away (from the house)

Third, with regard to stress, in the unmarked case and with only pronominal objects (which are more diagnostic than non-pronominal objects), a preposition is unstressed and a satellite is stressed, as can be determined for the sentences in (100) above. In fact, in a sentence whose NPs are all pronominal, a satellite – or the final satellite if there are more than one – is generally the most heavily stressed word of all, as in *I dragged him away from it*, or in *You come right back down out from up in there*.

Finally, the English Path system has a special feature. There are a number of forms like *past* that behave like ordinary satellites when there is no final nominal, as in (101a), but that, if there is a final nominal, even a pronominal one, appear directly before it and get heavy stress. That is, they have the pre-positioning property of a preposition but the stress of a satellite.

(101) a. (I saw him on the corner but) I just drove *pást*
       b. I drove *pást* him

Because of its distinct dual behaviour, the latter usage of a form like *past* can be considered to exemplify a new (and perhaps rare) grammatical category – a coalesced version of a satellite plus a preposition that could be termed a 'satellite-preposition' or 'satprep' – as suggested symbolically in (102a). Alternatively, it can be considered an ordinary satellite that happens to be coupled with a zero preposition, as suggested in (102b):

(102) a. F . . . ←past >G
       b. F . . . ←past Ø >G

Examples of other satpreps in English are *through*, as in *The sword ran through him*, and *up*, as in *I climbed up it*. Indeed, despite its apparent bi-morphemic origin, the form *into* now acts like a satprep that is phonologically distinct from the combination of the satellite *in* followed by the preposition *to*, as seen in *The bee's sting went into him* vs *Carrying the breakfast tray, the butler went in to him*. On the same phonological basis, *out of* also behaves like a single satprep unit, by contrast with the sequence *out from*, as in *She ran out-of it* vs *She ran out from behind it*. Perhaps English has developed the satprep form because it has come to regularly juxtapose its inherited satellite and preposition forms. But, as will shortly be seen, Mandarin, for one other language, also exhibits a homologue of the satprep. A summary of the various satellite and preposition distinctions in English is given in (103).

(103) a. *preposition + NP:*   (Mary invited me to her party.) I went to it.
       b. *satellite:*   (I heard music on the second floor.) I went úp.
       c. *satellite + preposition + NP:*   (There was a door set in the wall.) I went úp to it.
       d. *satprep + NP:*   (There was a stairway to the second floor.) I went úp it.
       e. *satellite + NP:*   (They wanted the phone on the second floor.) I took it úp.

Mandarin Chinese has Path satellites and constructions that are entirely homologous with those of English. A number of these satellites are listed here

(they variously may, cannot, or must be further followed by the satellite for 'hither' or for 'thither'):

(104)   ←*qù*   'thither'   ←*guò*   'across/past'
          ←*lái*   'hither'   ←*qí*   'up off'
          ←*shàng*   'up'   ←*diào*   'off (He ran *off*)'
          ←*xià*   'down'   ←*zǒu*   'away'
          ←*jìn*   'in'   ←*huí*   'back'
          ←*chū*   'out'   ←*lǒng*   'together'
          ←*dào*   'all the way (to)'   ←*kāi*   'apart/free'
          ←*dǎo*   'atopple (i.e., pivotally over)' ←*sàn*   'ascatter'

These satellites participate in Path expressions of either the coalesced or the uncoalesced type. The only apparent difference from English is an order distinction: the object of the coalesced form follows the verb complex, whereas the prepositional phrase of the uncoalesced form precedes it (as is general with prepositional phrases of any kind). Some satellites can participate in both constructions. One of these is the satellite meaning 'past', which we see here in two different sentences that receive the same translation in English:

(105)   F . . .   ←guò (-ø> G-biān)   (coalescence of satellite and
                                                          preposition)
                      past   side
          Píng-zi piāo   guò shí-tóu páng-biān
          bottle   float past rock('s) side
          'The bottle floated past the rock'

(106)   F . . .   ←guò (cóng> G-biān)   (the uncoalesced form with
                                                          both a satellite and a
                                                          preposition)
                      past   from   side
          Píng-zi cóng   shí-tóu páng-biān piāo   guò
          bottle   from   rock('s) side   float past
          'The bottle floated past the rock'

2.2   *Path + Ground*

In a conflation pattern distinct from the preceding one, a satellite can express at once both a particular Path and the kind of object acting as Ground for the Path. Satellites of this sort seem to be rare in the languages of the world. However, they constitute a major type in certain Amerindian languages. English does have a few examples, which can serve to introduce the type. One is the form *home* in its use as a satellite, where it has the meaning 'to his/her/ . . . home'. Another is the form *shut*, also in its satellite use, where it means 'to (a position)

across its/ . . . associated opening'. These forms are here illustrated in sentences, optionally followed by prepositional phrases that amplify the meanings already present in them:

(107)   a. She drove *home* (to her cottage in the suburbs)
        b. The gate swung *shut* (across the entryway)

The reason it can be concluded that such satellites incorporate a Ground in addition to a Path is that they are informationally complete with respect to that Ground, rather than anaphoric or deictic. Accordingly, a discourse can readily begin with their use, as in: *The President swung the White House gate shut and drove home*. By contrast, a Path satellite is informationally complete with respect to the Path, but it only indicates a type of Ground and, by itself, can only be anaphoric or deictic with respect to any particular instantiation of such a Ground. Thus, while English *in* indicates an enclosure as Ground, it cannot by itself refer to a particular enclosure, as seen in: *The President drove in*. For that, it must be accompanied by some explicit reference to the Ground object, as in: *The President drove into a courtyard*.

   Atsugewi is one language which has such Path + Ground satellites as a major system.[53] It has some fifty forms of this sort. We can illustrate the system by listing the fourteen or so separate satellites that together are roughly equivalent to the English use of *into* with different particular nominals. (A '+' here indicates that the satellite must be followed by one of *-im/-ik·,* 'hither'/'thither'):

(108)   *Path + Ground satellites in Atsugewi*
        -ič̓t   'into a liquid'
        -cis   'into a fire'
        -isp -u· + 'into an aggregate' (e.g. bushes, a crowd, a rib-cage)
        -wam   'down into a gravitic container' (e.g. a basket, a
                      cupped hand, a pocket, a lake basin)
        -wamm   'into an areal enclosure' (e.g. a corral, a field, the area
                      occupied by a pool of water)
        -ipsn^u +   '(horizontally) into a volume enclosure' (e.g. a house,
                      an oven, a crevice, a deer's stomach)
        -tip -u· + 'down into a (large) volume enclosure in the ground'
                      (e.g. a cellar, a deer-trapping pit)
        -ikn +   'over-the-rim into a volume enclosure' (e.g. a gopher
                      hole, a mouth)

---

[53] Judging from their distribution, satellites of this type seem to be an areal phenomenon rather than a genetic one. Thus, Atsugewi and Klamath, neighbouring but unrelated languages, both have extensive suffixal systems of these satellites. But the Pomo languages, related to Atsugewi and sharing with it the extensive Cause prefix system (see section 2.5), quite lack Path + Ground satellites.

-ikc	'into a passageway so as to cause blockage' (e.g. in choking, shutting, walling off)
-iks^u +	'into a corner' (e.g. a room corner, the wall–floor edge)
-mik·	'into the face/eye(s) (or onto the head) of someone'
-miċ	'down into (or onto) the ground'
-cis^u +	'down into (or onto) an object above the ground' (e.g. the top of a tree stump)
-iks	'horizontally into (or onto) an object above the ground' (e.g. the side of tree trunk)

Instances of the use of this satellite system can be seen in the Atsugewi examples appearing earlier, (36a,b,c), (65a,b), and (74). Two further examples are given in (109).

(109) a. Verb root: *-staq̇-*   'for runny icky material to move / be located'

  Directional suffix: *-ipsn^u*   'into a volume enclosure'
  Deictic suffix: *-ik·*   'hither'
  Cause prefix: *ma-*   'from a person's foot/feet acting on (the Figure)'
  Inflectional affix-set: ʾ- w- -^a   '3rd person subject, factual mood'

  /ʾ-w-ma-staq̇-ipsn^u-ik·-^a/ ⇒ [ma·staq̇ipsnuk·a]
  Literal: 'He caused it that runny icky material move hither into a volume enclosure by acting on it with his feet'
  Instantiated: 'He tracked up the house (coming in with muddy feet)'

  b. Verb root: *-lup-*   'for a small shiny spherical object to move / be located'
  Directional suffix: *-mik·*   'into the face/eye(s) of someone'
  Cause prefix: *phu-*   'from the mouth – working egressively – acting on (the Figure)'
  Inflectional affix-set: *m- w- -^a*   'thou-subject 3rd person object, factual mood'

  /m-w-phu-lup-mik·-^a/ ⇒ [mphol·úp^hmik·a]
  Literal: 'You caused it that a small shiny spherical object move into his face by acting on it with your mouth working egressively'
  Instantiated: 'You spat your candy-ball into his face'

2.3   *Patient: (Figure/)Ground*

Another type of satellite is one that indicates the Patient of an event being referred to. Such satellites constitute a major system, for example, in 'noun-incorporating' Amerindian languages. These languages include an affixal form of the satellite within their polysynthetic verb. Caddo is a case in point. Here, the satellite gives a typically more generic identification of the Patient. The sentence may also contain an independent nominal that gives a typically more specific identification of the same Patient, but the satellite must be present in any case. Here first are some non-motion examples, with (110a) showing the Patient as subject in a non-agentive sentence, and (b) and (c) showing it as direct object in agentive sentences:

(110) a. ʔíniku? *hák*-nisah-ni-káh-sa? ⇒ [ʔíniku? háhnisánkáhsa?]
           church   PROG-house-burn-PROG
           Literally: 'The church is house-burning (i.e., building-burning)'
           Loosely: 'The church is burning'

       b. cú·cu?   *kan*-yi-da?k-ah ⇒ [cú·cu? kanida?kah]
           milk   liquid-find-PAST
           Literally: 'He liquid-found the milk'
           Loosely: 'He found the milk'

       c. widiš   *dá?n*-yi-da?k-ah ⇒ [widiš dânnida?kah]
           salt   powder-find-PAST
           Literally: 'He powder-found the salt'
           Loosely: 'He found the salt'

Without the independent noun, the last example would work in this way:

(111)   *dá?n*-yi-da?k-ah
           'He powder-found it'/ 'He found it (something powdery)'

In Caddo's general pattern for expressing Motion, the verb root indicates Motion together with Path, in the manner of Spanish. The incorporated noun can under limited conditions – it is not yet clear what these are – indicate the Figure, as in this locative example:

(112)   yak-čah-yih   *nisah*-ya-?ah ⇒ [dahčahih tisáy?ah]
           woods-edge-LOC house-be-TNS
           Literally: 'At woods edge it-house-is'
           Loosely: 'The house is at the edge of the woods'

Usually, the incorporated noun indicates the Ground:

(113) a. wá·kas   na-*yawat*-yá-ynik-ah ⇒ [wá·kas táywacáynikah]
         cattle   PL-water-enter-PAST
         Literally: 'Cattle water-entered'
         Loosely: 'The cattle went into the water'

       b. *nisah*-nt-káy-watak-ah ⇒ [tisánčáywakkah]
          house-penetrate/traverse-PAST
          Literally: 'He-house-traversed'
          Loosely: 'He went through the house'

2.4   *Manner*

An uncommon type of satellite is one expressing Manner. An extensive system of such satellites is found in Nez Perce, another polysynthetic language of North America (see Aoki (1970)). In Motion sentences, the verb root in this language is like that of Spanish: it expresses Motion + Path. But at the same time, a prefix adjoining the root specifies the particular Manner in which the Motion is executed. An example of this arrangement is given in (114).

(114) /hi-   ququ·-   láhsa -e/ ⇒ [hiqqoláhsaya]
       3rd person   galloping go.up PAST
       Literally: 'He/she ascended galloping'
       Loosely: 'He galloped uphill'

We list here a selection of Nez Perce Manner prefixes. Note that not just loco-motive manners are expressed, but also ones of affect ('in anger') and activity ('on the warpath'):

(115) *Nez Perce Manner prefixes*
       ʔipsqi-   'walking'
       wilé·-   'running'
       wat-   'wading'
       siwi-   'swimming-on-surface'
       tukʷe-   'swimming-within-liquid'
       we·-   'flying'
       tu·ke-   'using a cane'
       ceptukte-   'crawling'
       tukweme-   '(snake) slithering'
       wu·l-   '(animal) walking / (human) riding (on animal at a walk)'
       ququ·-   '(animal) galloping / (human) galloping (on animal)'
       tiq̇e-   '(heavier object) floating-by-updraft / wafting/gliding'
       ʔiyé·-   '(lighter object) floating-by-intrinsic-buoyancy'
       wis-   'travelling with one's belongings'
       kipi-   'tracking'

tiẇek-	'pursuing (someone: D.O.)'
cú·-	'(plurality) in single file'
til-	'on the warpath / to fight'
qisim-	'in anger'

Assuming that polysynthetic forms arise through boundary and sound changes among concatenated words, one can imagine how a Nez-Perce-type system could have developed from a Spanish type. Originally independent words referring to Manner came regularly to stand next to the verb and then became affixal (and in most cases also lost their usage elsewhere in the sentence). Indeed, one can imagine how Spanish might evolve in the direction of Nez Perce. The preferred position for Manner-expressing gerunds in Spanish is already one immediately following the Path verb, as in:

(116)   Entró   corriendo/volando/nadando/ . . . a   la   cueva
         he.entered running   flying   swimming   to the cave

Such gerunds might in time evolve into a closed-class system of fixed post-posed satellites, and perhaps even further into suffixes on the verb. One could thus imagine the few kinds of changes that would turn the Spanish system for expressing Motion into a homologue of the Nez Perce system.

2.5   Cause

A kind of satellite found in a number of languages, at least in the Americas, has traditionally been described as expressing 'Instrument'. However, these forms seem more to express the whole of a Cause event. This is because, at least in the familiar cases, not only the *kind* of instrumental object that is involved is indicated, but also the *way* in which this object has acted on a Patient (to cause an effect). That is, a satellite of this sort is equivalent to a whole subordinate clause expressing causation in English. In particular, a satellite occurring in a non-agentive verb complex is equivalent to a *from*-clause, as in (to take an actual example in translation): *The sack burst from a long thin object poking endwise into it*. And the same satellite occurring in an agentive verb complex is equivalent to a *by*-clause, as in *I burst the sack by poking a long thin object endwise into it*.

Perhaps the greatest elaboration of this satellite type occurs in the Hokan languages of northern California, with Atsugewi having some two dozen forms (see Talmy (1972:84–195, 407–67)). Here, most verb roots must take one or another of the Cause satellites, so that there is obligatory indication of the cause of the action expressed by the verb root (some verb roots cannot take these satellites, but they are in the minority). The full set of these satellites subdivides the semantic domain of possible causes fairly exhaustively. That is,

any perceived or conceived causal condition will likely be covered by one or another of the satellites. The majority of the Atsugewi Cause satellites, those in commonest use, are listed below in (117). They are grouped here according to the kind of instrumentality that they specify. As in other Hokan languages, they appear as short prefixes immediately preceding the verb root. Instances of these satellites in use in a verb have appeared in examples (36a, b, and c) and (109a and b), to which the reader is referred.

(117)   *Atsugewi Cause satellites (P = the Patient, E = the Experiencer)*
         natural forces
         ←*ca-*   'from the wind blowing on P'
         ←*cu-*   'from flowing liquid acting on P' (e.g., a river on a bank)
         ←*ka-*   'from the rain acting on P'
         ←*ra-*   'from a substance exerting steady pressure on P' (e.g. gas
                   in the stomach)
         ←*uh-*   'from the weight of a substance bearing down on P'
                   (e.g. snow on a limb)
         ←*miw-*   'from heat/fire acting on P'

         objects in action
         ←*cu-*   'from a linear object acting axially on P' (e.g. as in poking,
                   prodding, pool-cueing, piercing, propping)
         ←*uh-*   'from a linear object acting circumpivotally (swinging) on
                   P' (as in pounding, chopping, batting)
         ←*ra-*   a. 'from a linear object acting obliquely on P' (as in
                      digging, sewing, poling, leaning)
                   b. 'from a linear/planar object acting laterally along the
                      surface of P' (as in raking, sweeping, scraping, plowing,
                      whittling, smoothing, vising)
         ←*ta-*   'from a linear object acting within a liquid P' (as in
                   stirring, paddling)
         ←*ka-*   'from a linear object moving rotationally into P' (as in
                   boring)
         ←*mi-*   'from a knife cutting into P'
         ←*ru-*   'from a (flexible) linear object pulling on or inward upon
                   P' (as in dragging, suspending, girding, binding)

         body parts in action
         ←*tu-*   'from the hand(s) – moving centripetally – acting on
                   P' (as in choking, pinching)
         ←*ci-*   'from the hand(s) – moving manipulatively – acting on P'
         ←*ma-*   'from the foot/feet acting on P'
         ←*ti-*   'from the buttocks acting on P'
         ←*wi-*   'from the teeth acting on P'

←*pri-*   'from the mouth – working ingressively – acting on P'
               (as in sucking, swallowing)

←*phu-*   'from the mouth – working egressively – acting on P'
               (as in spitting, blowing)

←*pu-*   'from the lips acting on P'

←*hi-*   'from any other body part (e.g. head, shoulder) or the
               whole body acting on P'

sensations

←*sa-*   'from the visual aspect of an object acting on E'

←*ka-*   'from the auditory aspect of an object acting on E'

←*tu-*   'from the feel of an object acting on E'

←*pri-*   'from the taste/smell of an object acting on E'

2.6   Motion-related satellites extending the motion typology

Table 2.2 (section 1.4) showed the three major categories into which languages
fall in their treatment of Motion. The typology was based on which component
of a Motion event is characteristically expressed in the verb root (together with
'fact of Motion', which always appears there). For each such language type,
the next issue is where the remaining components of the Motion event are
located. The satellite is the most diagnostic syntactic constituent to look at after
the verb, and so we can make a revealing subcategorization by seeing which
Motion components characteristically appear in the satellites that accompany
the verb. See table 2.12.[54]

2.6.1   Verb-framed and satellite-framed systems

As noted, the typology summarized in this table is based on looking at selected
syntactic constituents – first the verb root and then the satellite – to see which
components of a Motion event characteristically show up in them. But a com-
plementary typology could be based on looking at selected components of a
Motion event to see which syntactic constituents they characteristically show up
in. This latter approach is adopted in Talmy (2000b: ch. 3). As observed there,
the typologically most diagnostic component to follow is the Path. Path appears
in the verb root in 'verb-framed' languages such as Spanish, and it appears in the
satellite in 'satellite-framed' languages such as English and Atsugewi. Further,
as a major generalization over the typology that has been treated in the present
chapter, where Path appears, there, too, appear four other kinds of semantic
constituents: aspect, state change, action correlation, and realization.

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[54] This typology has served in several other lines of research, e.g., that seen in Choi and Bowerman
(1991) and that in Berman and Slobin (1994), and Slobin (in press). Slobin (1997) has uncovered
correlates of the present sentence-level typology within larger stretches of discourse.

Table 2.12 *Typology of Motion verbs and their satellites*

Language/language family	The particular components of a Motion event characteristically represented in the:	
	Verb root	Satellite
Romance	Motion + Path	
Semitic		ø
Polynesian		
- - - - - - - - - -		- - - - - - - - - -
Nez Perce		Manner
- - - - - - - - - -		- - - - - - - - - -
Caddo		(Figure/)Ground [Patient]
Indo-European (not Romance)	Motion + $\left\{ \begin{array}{l} \text{Cause} \\ \text{Manner} \end{array} \right\}$	Path
Chinese		
Atsugewi (most northern Hokan)	Motion + Figure	a. Path + Ground b. Cause

2.6.2   *Typological shift and maintenance*

Tracing the route by which a language shifts its typological pattern for the expression of Motion events – or indeed, maintains its pattern while other changes are ongoing – can be a rich research area for diachronic linguistics. We can suggest some processes here.

Consider first some forms of change and maintenance within Indo-European. For their characteristic representation of Motion events, Latin, Classical Greek, and Proto-Germanic all exhibited the presumably Indo-European pattern of using Co-event-conflating verb roots together with Path satellites that formed prefixes on the verb roots. Perhaps because of phonological changes that rendered the Path prefixes less distinct from each other and from the verb roots, all three languages apparently became unable to maintain their inherited pattern. Both Germanic and Greek proceeded to develop a new set of Path satellites that largely supplanted the prior set. In German, for example, a few of the original Path satellites continue on as 'inseparable prefixes', while the new set comprises the much more numerous 'separable prefixes'. This development of a fresh Path satellite system permitted the maintenance of the inherited pattern for representing Motion events with Co-event verb conflation.

The languages arising from Latin, on the other hand, each developed a new system of Path-conflating verbs, rather than reestablishing the Path satellite system. In this process, each of the daughter languages formed its set of Path

verbs in its own way by variously coining new verbs or shifting the semantics
of inherited verbs so as to fill out the basic directional grid of the new Path verb
system. The factors that may have tilted one language toward reestablishing its
typological category and another language toward shifting to another category
must yet be discerned.

From its classical to its contemporary form, Chinese appears to have under-
gone a typological shift in a direction just the reverse of that exhibited by
the Romance languages: from a Path-conflation pattern to a Manner/Cause-
conflation pattern (see F. Li (1993)). Classical Chinese had a full set of Path
verbs used as main verbs in the representation of Motion events. Through the
development of a serial verb construction, these Path verbs have progressively
come to have their main occurrence as second-position elements following a
Manner/Cause-conflating verb. While the serial verb interpretation is still avail-
able, these second-position elements appear to have been incrementally turning
into a system of Path satellites following a Manner/Cause main verb. Favouring
this reinterpretation is the fact that some of the morphemes with clear Path
senses in second position have become less colloquial or obsolescent or obso-
lete as main verbs, or that in their usage as a main verb, they have meanings
only partially or metaphorically related to their Path sense.

2.7   Aspect

Many languages have satellites that express aspect. Frequently, these satellites
do not indicate purely 'the distribution pattern of action through time' (as aspect
was characterized earlier). This purer form is mixed with, or shades off into,
indications of manner, quantity, intention, and other factors. Accordingly, a
liberal interpretation is given to aspect in the examples below. In this way, we
can present together many of the forms that seem to be treated by a language
as belonging to the same group. The demonstration can begin with English.
Though this language is not usually thought of as expressing aspect in its
satellites (as, say, Russian is), it is in fact a fully adequate example:

(118)   *English aspect satellites (V = to do the action of the verb)*
          ←re-/←over 'V again/anew'
          When it got to the end, the record automatically restarted / started
          over from the beginning
          ←on   'continue Ving without stopping'
          We talked/worked on into the night
                         'resume where one had left off in Ving'
          She stopped at the gas station first, and then she drove on from
          there
                         'go ahead and V against opposition'

He was asked to stay on the other side of the door, but adamant, he
barged on in

←away   'continue Ving (with dedication/abandon)'
They worked away on their papers
They gossiped away about all their neighbours
                'feel free to embark on and continue Ving'
'Would you like me to read you some of my poetry?' 'Read away!'

←along   'proceed in the process of Ving'
We were talking along about our work when the door suddenly
burst open

←off   'V all in sequence/progressively'
I read/checked off the names on the list
All the koalas in this area have died off

←up   'V all the way into a different (a non-integral/
                denatured) state'
The log burned up in two hours
    (cf. The log burned for one hour before I put it out)
The dog chewed the mat up in twenty minutes
    (cf. The dog chewed on the mat for ten minutes before I took it
    away)

←back   'V in reciprocation for being Ved'
He had teased her, so she teased him back

Other languages have forms comparable to those of English, though often
with different, or more varied meanings. Russian is a case in point. In addition
to several forms like those in the English list, Russian has (at least) the following
(some of the examples are from Wolkonsky and Poltoratzky (1961)):

(119)   *Russian aspect satellites*
        ←*po-*   'V for a while'
        Ja poguljal
        I 'po'-strolled
        'I strolled about for a while'
        Xočets'a poletat' na samolete
        wants.REFL 'po'-fly on airplane
        'I'd like to fly for a while on a plane (i.e., take a short flight)'

        ←*pere-*   'V every now and then'
        Perepadajut doždi
        'pere'-fall rains (N)
        'Rains fall (It rains) every now and then'

        ←*za-*   'start Ving'
        Kapli doždja zapadali odna za drugoj

      drops rain.GEN 'za'-fell one after another
      'Drops of rain began to fall one after another'

←*raz-* +REFL   'burst out Ving'

      Ona rasplakalas'
      she 'za'-cried.REFL
      'She burst out crying'

←*pro-*/←*pere-*/ . . . 'complete the process of Ving'

      Pivo perebrodilo
      beer 'pere'-fermented
      'The beer has finished fermenting'

←*po-*/ . . .   'V as one complete act'

      On eë poceloval
      he her 'po'-kissed
      'He kissed her' (vs: 'was kissing', 'kept kissing', 'used to kiss')

←*na-* +REFL   'V to satiation'

      On naels'a
      he 'na'-ate.REFL
      'He ate his fill'

←*s-*   'V and de-V as one complete cycle' [only
                     with motion verbs]

      Ja sletal v odin mig na počtu
      I 's'-flew in one moment to post-office
      'I got to the post office and back in no time'

Within its affixal verb complex, Atsugewi has certain locations for a group of aspect-related satellites. These are semantically of two kinds, indicating what can be called 'primary' and 'secondary' aspectual notions. The primary kind indicates how the action of the verb root is distributed with respect to the general flow of time. The secondary kind indicates how the action is distributed with respect to another ongoing event, namely one of moving along (cf. Wilkins's (1991) 'associated motion'). In translation, these forms can be represented as in table 2.13. We can illustrate the second satellite type as follows:

(120)   Verb root: *acp-*   'for contained solid material to move / be located'

          Secondary aspect suffix: *-ikc*   'to a position blocking passage', hence: 'in going to meet (and give to) someone approaching'

          Inflectional affix-set: *s-* ʹ*- w-* -ᵃ 'I-subject 3rd person object, factual mood'

Table 2.13 *Atsugewi aspect satellites' meanings*

V's action is related to:	
the general temporal flow	an ongoing locomotory event
almost V	go and V
still V	go Ving along
V repeatedly	come Ving along
V again/back, reV	V in passing
start Ving	V going along with someone
finish Ving	V coming along with someone
V as a norm	V in following along after someone
V awhile / stay awhile and V	V in going to meet someone
V in a hurry / hurry up and V	
V a little bit / spottily / cutely	

Independent noun: *ta'ki·*   'acorns'
Nominal marker: c
  /s-'-w-acp-ikc-ᵃ c ta'ki· / ⇒[s'wacpík^{h}ca c ta?'kí·]
Literally: 'I caused it that contained solid material – namely, acorns –
move, in going to meet (and give it to) someone approaching'
Loosely: 'I carried out the basket full of acorns to meet him with, as
he approached'[55]

2.8   Valence

In section 1.9 we saw satellites (German *be-* and *ver-*, Atsugewi *-ah'w*) involved
solely with valence: they signalled shifts in the incorporated valence require-
ments of verb roots. There are also satellites that basically refer to other notions,
such as Path, but themselves incorporate valence requirements. When these are
used with verbs that have no competing requirements, it is they that determine
the grammatical relations of the surrounding nominals. We look at this situation
now.

2.8.1   Satellites determining the Figure–Ground precedence
        pattern of the verb

Consider these Path satellites (or satellite + preposition combinations) referring
to surfaces:

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[55] Though this may remove some of Atsugewi's mystique, notice that the German satellite *entgegen-*
also has the 'in going to meet' meaning, as in *entgegenlaufen* 'run to meet'. And Latin *ob-*
parallels Atsugewi *-ikc* still further in having both the 'meeting' and the 'passage-blocking'
meanings, as in *occurrere* 'run to meet' and *obstruere* 'build so as to block off'.

(121)   a. Water poured *onto* the table   – 'to a point of the surface of'
         b. Water poured *all over* the table – 'to all points of the surface of'

These satellites require the Ground nominal as prepositional object and (in these non-agentive sentences) the Figure nominal as subject. The same holds for the satellite that refers to interiors in the following case:

(122)

a. Water poured *into* the tub – 'to a point / some points of the inside of'

However, English has no form comparable to *all over* for interiors:

(122)   b. *Water poured all into / ? the tub – 'to all points of the inside of'

A new locution must be resorted to. This locution, moreover, differs from the others in that it has the reverse valence requirements: the Figure as prepositional object and the Ground (in non-agentive sentences) as subject:

(123)   The tub poured *full of* water

By the opposite token, the satellite for surfaces does not allow this reverse valence arrangement:

(124)   *The table poured all over with/of water

   This same pattern applies as well to agentive sentences, except that what was the subject nominal is now the direct object:

(125)   'surfaces'
         a. I poured water onto the table
         b. I poured water all over the table
            (* I poured the table all over with/of water)

         'interiors'
         c. I poured water into the tub
            (* I poured water all into the tub)
         d. I poured the tub full of water

   Using the earlier notation, the valence requirements of these satellites can be represented thus:

(126)   a. F . . . ⬅on (-to> G)
         b. F . . . ⬅all-over (ø> G)
         c. F . . . ⬅in (-to> G)
         d. G . . . ⬅full (-of> F)

With the concept of a precedence hierarchy among grammatical relations that places subject and direct object above prepositional object, we can say that in English the notion of a 'filled surface' expressed in a satellite requires the basic

Figure-above-Ground, or F-G, precedence, while the notion of a 'filled interior' requires the reverse Ground-above-Figure, or G-F, precedence.

In many languages, certain notions expressed in satellites require one or the other of these same precedence patterns. For example, in Russian, the notion 'into' can only be in the basic F-G precedence pattern:

(127)   a. Ja v-lil   vodu   v stakan
            I in-poured water(ACC) in glass(ACC)
            'I poured water into the glass'

        b. *Ja v-lil   stakan   vodoj
            I   in-poured glass(ACC) water(INSTR)
            *'I poured the glass in with water'

By contrast, the notion 'all around' (i.e., 'to all points of the surrounding surface of') requires the reversed G-F precedence pattern:

(128)   a. *Ja ob-lil   vodu   na/? sabaku
            I   circum-poured water(ACC) on   dog(ACC)
            *'I poured water all round the dog'

        b. Ja ob-lil   sabaku   vodoj
            I circum-poured dog(ACC) water(INSTR)
            'I poured the dog round with water'

Accordingly, these satellites can be represented notationally as:

(129)   a. F . . . ←v- (v + ACC> G)   b. G . . . ←ob- (ø + INSTR> F)

Outside Indo-European, Atsugewi exhibits similar cases of Path satellites requiring either basic F-G or reversed G-F precedence. Two such satellites, respectively, are *-cis* 'into a fire' and *-mik·* 'into someone's face' (represented below as *afire* and *aface*):

(130)   a. /ac^h ø-   s-'-i:-^{a} s-'-w-ra+p'l-cis-^{a} c   ah'w–i?/
            water OBJ-   TOPICALIZER   INFL-pour-afire   NP fire-to
                ⇒[ʔác^h·i se·s'wlap^h'l íc^h·a c   ʔah'wí?]
            'I-poured-afire water-ACC (F) campfire-to (G)'
            'I threw water over the campfire'

        b. /ac^h- a?   t-   s-'-i:-^{a}
            water- with   NONOBJ-   TOPICALIZER
                s-'-w-ra+p'l-mik·-^{a} c   a'wtih/
                INFL-pour-aface   NP man
                ⇒ [ʔac^h·á? c^{h}e·   s'wlap^h'lím·ik·a   c   ʔáw']
            'I-poured-aface man- ACC (G) water-with (F)'
            'I threw water into the man's face' ('I threw the man aface
            with water')

In some cases, a Path satellite can be used with either valence precedence. English *through* works this way in usages like:

(131)   (*it* = 'my sword')
      a. I (A) ran it (F) *through* him (G)
      b. I (A) ran him (G) *through* with it (F)

Of these two usages of *through*, the former is actually a satellite preposition. Both usages would appear in our formula representation respectively as:[56]

(132)   a. F . . . ←through> G
      b. G . . . ←through (with> F)

In other cases, there are two satellites, with the same meaning and sometimes with similar forms, that act as a complementary pair in handling either valence precedence. The Yiddish separable verb prefixes for directional 'in', *arayn-* and *ayn-*, work this way (cf. Talmy 2000b: ch. 4):

(133)   a. F . . . ←arayn- (in> G)   '(directional) in F-G'
         G . . . ←ayn-   (mit> F)   '(directional) in G-F'

      b. Ix hob   arayn-geštoxn a dorn (F) in   ferd (G)
         I   have in(FG)-stuck   a thorn   in.the horse
         'I stuck a thorn into the horse'

      c. Ix hob   ayn-geštoxn dos ferd (G) mit   a dorn (F)
         I   have in(GF)-stuck the horse   with a thorn
         'I stuck the horse (in) with a thorn'

2.8.2   Satellites requiring Direct Object to indicate 'bounded Path'

Several Indo-European languages have the same pattern for distinguishing between bounded and unbounded Paths through the use of two parallel constructions. These constructions differ with respect to a valence-controlling satellite. When the Path is bounded and is completed 'in' a quantity of time, the verb has a Path satellite that requires the Ground as direct object. For the corresponding unbounded Path that lasts 'for' a quantity of time, there is no Path satellite at all but rather a Path preposition that takes the Ground as prepositional object. Russian exhibits this pattern. The satellites illustrated here are *ob-* 'circum-', present in (134a i) but not (ii), *pro-* 'length-', present in (134b i) but not (ii), and *pere-* 'cross-', present in (134c i) but not (ii).

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[56] Such formulae usually present a satellite construction in a non-agentive format. But they are readily adapted to an agentive presentation:
a.   A . . . F ←through> G
b.   A . . . G ←through (with> F)
Such finer formulations can be useful in representing language particularities. Thus, English in fact lacks the (a) construction and only has its agentive (b) counterpart.

(134)

a. (i) Satelit   obletel   zemlju   (v 3 časa)
     satellite(NOM) circum.flew earth(ACC) in 3 hours
     'The satellite flew around the earth in 3 hours – i.e., made
     one complete circuit'

  (ii) Satelit   letel   vokrug zemli   (3 dnja)
     satellite(NOM) flew.around around earth(GEN) for 3 days
     'The satellite flew around the earth for 3 days'

b. (i) On probežal   (vsju) ulicu   (v 30 minut)
     he length-ran all   street(ACC)   in 30 minutes
     'He ran the length of the (whole) street in 30 minutes'

  (ii) On bežal   po   ulice   (20 minut)
     he ran-along along street(DAT) for 20 minutes
     'He ran along the street for 20 minutes'

c. (i) On perebežal ulicu   (v 5 sekund)
     he cross.ran street(ACC) in 5 seconds
     'He ran across the street in 5 seconds'

  (ii) On bežal   čerez ulicu   (2 sekundy) i   potom ostanovils'a
     he ran-along across street(ACC) for 2 seconds and then   stopped
     'He ran across the street for 2 seconds and then stopped'

A comparable pattern may exist in German, though presently with varying degrees of colloquiality. In this pattern, the inseparable form of a Path satellite is used for the transitive construction. The satellites illustrated here are inseparable *über-* 'cross-' and *durch-* 'through-', present in (135a) but not (b).

(135)

a. Er überschwamm / durchschwamm den Fluss   in 10 Minuten
  he over-swam /   through-swam   the river(ACC) in 10 minutes
  'He swam across / through the river in 10 minutes'

b. Er schwamm schon   10 Minuten (über / durch   den Fluss),
  he swam   already 10 minutes over / through the river (ACC),

    als   das Boot kam
    when   the boat came

  'He had been swimming (across / through the river) for 10 minutes
  when the boat came'

The question of universality must be asked with regard to satellite valence distinctions like those we have seen. For example, in Indo-European languages, satellites expressing a 'full interior' seem without exception to require

the reversed G-F precedence pattern, and satellites expressing bounded Paths largely tend to require the Ground as direct object. Are these and comparable patterns language-particular, family-wide, or universal?

3   Salience in the verb complex

A theoretical perspective that encompasses both sections 1 and 2 pertains to *salience* – specifically, the degree to which a component of meaning, due to its type of linguistic representation, emerges into the foreground of attention or, on the contrary, forms part of the semantic background where it attracts little direct attention (see Talmy 2000a: chs. 1 and 4). With regard to such salience, there appears to be an initial universal principle. Other things being equal (such as a constituent's degree of stress or its position in the sentence), a semantic component is backgrounded by expression in the main verb root or in any closed-class element, including a satellite – hence, anywhere in the main verb complex. Elsewhere, though, it is foregrounded. This can be called the principle of *backgrounding according to constituent type*. For example, the first two sentences in (136) are virtually equivalent in the total information that they convey. But they differ in that the fact of the use of an aircraft as transport is foregrounded in (136a) due to its representation by an adverb phrase and the noun that it contains, whereas it is an incidental piece of background information in (136b), where it is conflated within the main verb.

(136)   a. I went by plane to Hawaii last month
          b. I flew to Hawaii last month
          c. I went to Hawaii last month

The following second principle appears to serve as a companion to the preceding principle. A concept or a category of concepts tends to be expressed more readily where it is backgrounded. That is, speakers tend to opt for its expression over its omission more often where it can be referred to in a backgrounded way than where it can only be referred to in a foregrounded way. And it tends to be stylistically more colloquial, or less awkward, where it can be backgrounded than where it must be foregrounded. This can be called the principle of *ready expression under backgrounding*. For instance, a Manner concept – such as the use of aeronautic transport, as in the preceding example – is probably expressed more readily – that is, is expressed more frequently and colloquially – when represented in a backgrounding constituent, like the main verb of (136b), than when represented in a foregrounding constituent, like the adverb phrase of (136a).

This second principle itself has a companion: where a concept is backgrounded and thus is readily expressed, its informational content can be included

in a sentence with apparently low cognitive cost – specifically, without much additional speaker effort or hearer attention. This third principle can be called *low cognitive cost of extra information under backgrounding*. Thus, (136b), in addition to expressing the same informational content as (136c), including the specific concept of translocation, adds to this the fact that this translocation was accomplished through the use of aeronautic transport. But this additional concept is included, as it were, 'for free', in that (136b) can apparently be said as readily, and with as little speaker or hearer effort, as the less informative sentence in (136c).

Finally, a consequence of the third principle is that a language can casually and comfortably pack more information into a sentence where it can express that information in a backgrounded fashion than can another language – or another sector of usage within the same language – that does not permit the backgrounded expression of such information. This can be called the principle of *ready inclusion of extra information under backgrounding*.

This fourth principle can be demonstrated with respect to the present issue of differential salience across different language types, as well as across different sectors of a single language. Languages may be quite comparable in the informational content that they can express. But a way that languages genuinely differ is in the amount and the types of information that can be expressed in a backgrounded way. English and Spanish can be contrasted in this regard. English, with its particular verb-conflation pattern and its multiple satellite capability, can convey in a backgrounded fashion the Manner or Cause of an event and up to three components of a Path complex, as in (137):

(137)   The man ran back down into the cellar.

In this rather ordinary sentence, English has backgrounded – and hence, by the fourth principle, been readily able to pack in – all of the information that the man's trip to the cellar was accomplished at a run (*ran*), that he had already been in the cellar once recently so that this was a return trip (*back*), that his trip began at a point higher than the cellar so that he had to descend (*down*), and that the cellar formed an enclosure that his trip originated outside of (*in-*). Spanish, by contrast, with its different verb-conflation pattern and almost no productive satellites, can background only one of the four English components, using its main verb for the purpose; any other expressed component is forced into the foreground in a gerundive or prepositional phrase. Again by the fourth principle, such foregrounded information is not readily included and, in fact, an attempted inclusion of all of it in a single sentence can be unacceptably awkward. Thus, in the present case, Spanish can comfortably express either the Manner alone, as in (138a), or one of the Path notions together with a gerundively expressed Manner, as in (138b–d). For acceptable style, further components must either

be omitted and left for possible inference, or established elsewhere in the discourse:

(138)   *Spanish sentences closest to information-packed English sentence*
        of (137)
        a. El   hombre corrió a-l   sótano
           the man   ran   to-the cellar
           'The man ran to the cellar'

        b. El   hombre volvió   a-l   sótano corriendo
           the man   went.back to-the cellar running
           'The man returned to the cellar at a run'

        c. El   hombre bajó   a-l   sótano corriendo
           the man   went.down to-the cellar running
           'The man descended to the cellar at a run'

        d. El   hombre entró   a-l   sótano corriendo
           the man   went.in to-the cellar running
           'The man entered the cellar at a run'

While the kind of contrast exemplified so far in this section has been at the level of a general pattern difference between two languages, the same kind of contrast can be observed at the level of individual morphemes, even between such similarly patterned languages as Russian and English. For example, Russian has a Path satellite + preposition complex, ←*pri- k* + DAT> 'into arrival at', that characterizes the Ground as an intended destination. English lacks this and, to render it, must resort to the Spanish pattern of expression using a Path-incorporating verb (*arrive*). As seen in the illustration in (139b), English, as usual with this non-native conflation type, exhibits awkwardness at further expressing the Manner component. As a baseline for comparison, (139a) illustrates the usual Russian–English parallelism. Here, both languages represent the Path concept 'to a point adjacent to but not touching' with a satellite + preposition complex: Russian ←*pod- k* + DAT>, and English ←*up to*>.

(139)   a. Russian: On pod-bežal k   vorotam
                     he up.to-ran to gates(DAT)
            English: He ran up to the gate
        b. Russian: On pri-bežal   k   vorotam
                     he into.arrival-ran to gates(DAT)
            English: He arrived at the gate at a run

In this example, English shows how different sectors of usage within a single language – even where this involves only different individual concepts to be expressed – can behave differently with respect to the two principles set forth at

the beginning of this section. Thus, Manner (here, 'running') can be expressed readily in a backgrounding constituent (the main verb) when in conjunction with the 'up to' Path notion. But it is forced into a foregrounding constituent (here, an adverb phrase) when in conjunction with the 'arrival' Path notion, and so can be expressed only at greater cognitive cost.

At the general level again, we can extend the contrast between languages as to the quantity and types of information they background, for as English is to Spanish, so Atsugewi is to English. Like English, Atsugewi can represent both Cause and Path in a backgrounded way in its verb complex. But further, it can backgroundedly represent the Figure and the Ground in its verb complex (as has already been shown). Take for example the polysynthetic form in (36b), here approximately represented with its morphemes glossed and separated by dashes:

(140)
(it) – from.wind.blowing   – icky.matter.moved   – into.liquid – Factual
      Cause. . . . .]   Figure. . . . .]   Path + Ground

We can try to match English sentences to this form in either of two ways: by achieving equivalence either in informational content or in backgroundedness. To achieve informational equivalence, the English sentence must include full independent noun phrases to express the additional two components that it cannot background, i.e., the Figure and the Ground. These NPs can be accurate indicators of the Atsugewi referents, like the forms *some icky material* and *some liquid* in (141a). Or, to equal the original form in colloquialness, the NPs can provide more specific indications that would be pertinent to a particular referent situation, like the forms *the guts* and *the creek* in (141b). Either way, the mere use of such NPs draws foregrounded attention to their contents. The representation of Cause and Path is not here at issue between the two languages, since both employ their means for backgrounding these components. Atsugewi backgrounds Cause in its Cause satellite and Path in its Path+Ground satellite, while English backgrounds Cause in the verb root (*blow*) and Path in its Path satellite (*in(to)*).

(141)   a. Some icky material blew into some liquid
          b. The guts blew into the creek

If, on the other hand, the English sentence is to achieve equivalence to the Atsugewi form in *backgroundedness* of information, then it must drop the full NPs or change them to pronouns, as in:

(142)   It blew in

Such equivalence in backgrounding, however, is only gained at the cost of forfeiting information, for the original Atsugewi form additionally indicates

that the 'it' is an icky one and the entry is a liquid one. Thus, due to the quantity and semantic character of its satellites, as well as the semantic character of its verb root, Atsugewi can, with relatively fine differentiation, express more of the components of a Motion event at a backgrounded level of attention than English is able to do.[57]

4   Conclusion

The principal result of this chapter has been the demonstration that semantic elements and surface elements relate to each other in specific patterns, both typological and universal. The particular contributions of our approach have included the following:

First, the chapter has demonstrated the existence and nature of certain semantic categories such as 'Motion event', 'Figure', 'Ground', 'Path', 'Co-event', 'Precursion', 'Enablement', 'Cause', 'Manner', 'Personation', etc., as well as syntactic categories such as 'verb complex', 'satellite', and 'satellite-preposition'.

Second, most previous typological and universal work has treated languages' lexical elements as atomic givens, without involving the semantic components that comprise them. Accordingly, such studies have been limited to treating the properties that such whole forms can manifest, in particular, word order, grammatical relations, and case roles. On the other hand, most work on semantic decomposition has not involved cross-linguistic comparison. The present study has united both concerns. It has determined certain semantic components that comprise morphemes and assessed the cross-linguistic differences and commonalities that these exhibit in their patterns of surface occurrence. Thus, instead of determining the order and roles of words, this study has addressed semantic components, as they appear at the surface, and has determined their presence, their site (i.e., their 'host' constituent or grammatical relation), and their combination within a site.

Third, our tracing of surface occurrence patterns has extended beyond treating a single semantic component at a time, to treating a concurrent set of components (as with those comprising a Motion event and its Co-event). Thus, the issue for us has not just taken the form: semantic component 'a' shows up in surface constituent 'x' in language '1' and it shows up in constituent 'y' in language '2'. Rather, the issue has also taken the form: with semantic component 'a' showing up in constituent 'x' in language '1', the syntagmatically related components 'b' and 'c' show up in that language in constituents 'y' and 'z', whereas language

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[57] The Atsugewi polysynthetic verb can background still more: Deixis and four additional nominal roles – Agent, Inducer, Companion, and Beneficiary. However, Deixis is distinguished only as between 'hither' and 'hence', and the nominal roles only as to person and number or, in certain circumstances, merely their presence in the referent situation. (See Talmy (1972).)

'2' exhibits a different surface arrangement of the same full component set. That is, this study has been concerned with whole-system properties of semantic–surface relations.

The present method of componential cross-linguistic comparison permits observations not otherwise feasible. Section 3 demonstrated this for the issue of information's 'salience'. Former studies of salience have been limited to considering only whole lexical items and, hence, only their relative order and syntactic roles – and, appropriate to these alone, have arrived at such notions as topic, comment, focus, and old and new information, for comparison across languages. But the present method can, in addition, compare the foregrounding or backgrounding of incorporated semantic components according to the type of surface site in which they show up. It can then compare the systemic consequence of each language's selection of such incorporations.

5   Suggestions for further reading

The present chapter proposes a typology for the representation mainly of an event of Motion and, to a lesser extent, of an event of change. And it bases this typology on the targeting of certain syntactic components (the verb and the satellite) and on the observation of which semantic components come to be expressed in them. An extension of this analysis is made in Talmy (2000b: ch. 3). That chapter generalizes the typology from events of Motion and change to cover three further types of events, ones of temporal contouring, action correlating, and realization and, inversely, it bases the typology on the targeting of certain semantic components (the Path schema and its analogues in the other event types) and on the observation of which syntactic components they come to be expressed in.

The present chapter deals with the patterns in the conflation of Motion event components and in the packaging of spatial components within spoken language. But patterns of quite a different kind appear within signed language in its so-called classifier system – perhaps better termed its Motion event system. This difference sheds much light on the organization of Motion and space within spoken language, as well as within linguistic cognition more generally. These comparisons and extensions are treated in Talmy (2002) and – in a more developed version – in Talmy (2003).

The present chapter deals with typological differences in the representation of a Motion event only over the span of a single sentence. Slobin (1997) has connected these differences with counterpart differences occurring over an extended discourse. To my knowledge, this is the most successfully demonstrated linkage between the more local scope of grammatical and semantic effects that are familiar within linguistics and the more global scope of discourse structure.

3 Inflectional morphology

Balthasar Bickel and Johanna Nichols

0   Introduction

The prototypical inflectional categories include number, tense, person, case, gender, and others, all of which usually produce different forms of the same word rather than different words. Thus *leaf* and *leaves*, or *write* and *writes*, or *run* and *ran* are not given separate headwords in dictionaries. Derivational categories, in contrast, do form separate words, so that *leaflet*, *writer*, and *rerun* will figure as separate words in dictionaries. In addition, inflectional categories do not in general alter the basic meaning expressed by a word; they merely add specifications to a word or emphasize certain aspects of its meaning. *Leaves*, for instance, has the same basic meaning as *leaf*, but adds to this the specification of multiple exemplars of leaves. Derived words, by contrast, generally denote different concepts from their base: *leaflet* refers to different things from *leaf*; and the noun *writer* calls up a somewhat different concept from the verb *to write*.

That said, finding a watertight cross-linguistic definition of 'inflectional' which will let us classify every morphological category as either inflectional or derivational is not easy. Nor can 'inflectional' be defined simply by generalizing over attested inflectional systems or paradigms; the cross-linguistic variation in both forms and categories is too great. Rather, we define inflection as those categories of morphology that are *regularly responsive 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.

[1]   In this we follow S. R. 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 chapter 1 of this volume.

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 agree in form with the head noun in an NP, as in the following German examples:[2]

(1)   German
        a. ein-e   gut-e   Lehrerin
           a.NOM.SG.FEM good-NOM.SG.FEM teacher(FEM).NOM.SG
           'a good (female) teacher'
        b. ein-es   gut-en   Lehrer-s
           a.GEN.SG.MASC good-GEN.SG.MASC teacher(MASC).GEN.SG
           'of a good 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. In (1a), the head noun *Lehrerin* has feminine gender and is inflected as nominative singular. This determines feminine nominative singular forms of the article and the adjective. In (1b), the head noun is masculine and in the genitive singular case, and this triggers masculine genitive singular forms of the article and the adjective. The choice of these article and adjective forms is thus an automatic response to the form and nature of the head noun. In 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 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 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 (1a) as *Lehrerin*).

Other examples of inflectional categories sensitive to syntax are case assignment (government), tense choice in complex sentences (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, e.g.:

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[2] See the list of abbreviations at the beginning of the volume.

(2)   *Imperfective Perfective*
     pisat'   napisat'   'write'
     govorit'   skazat'   'say'
     kupit'   pokupat' 'buy'
     delat'   sdelat'   'do'
     sadit'sja   sest'   'sit down'
     otcvetat'   otcvesti 'bloom'
     staret'   postaret' 'get old'
     pit'   vypit'   'drink'

That Russian 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'* '(he or she) will be drinking, will drink', i.e. the future is expressed analytically by combining an auxiliary verb *budet* '(he or she) will' and an infinitive *pit'* 'drink'. The same future tense of the perfective verb *vypit'* 'drink, drink up', by contrast, is expressed by the synthetic word form *vyp'et* '(he or she) will drink, will drink up'. Thus, the realization of future tense forms is determined by the aspect of the verb. In other words, 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 versus imperfective contrast of Russian; compare Russian *pit'* 'drink (IPFV)' versus *vypit'* (lit.: 'out-drink'), 'to drink up, drink to the end, empty (PFV)', and German *trinken* 'drink' versus *austrinken* (lit.: 'out-drink'), 'to drink up, drink to the end, 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 signalled by a stem difference or by suppletion (e.g. IPFV *otcvetat'* vs PFV *otcvesti* 'to bloom'; IPFV *govorit'* vs PFV *skazat'* 'to say'). Transparency

of marking has to do not with inflection versus derivation but with the choice
between what we will describe below as concatenative and nonlinear, and also
with that between flexive and nonflexive morphology, structural distinctions
that will be reviewed in section 1.

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 per cent 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
some cases) 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 inflec-
tion – 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 vol. I, chapter
5, on mood and illocutionary force, and chapters 4 and 5 of this volume on gen-
der, and tense, aspect and mood, respectively), and we limit ourselves to a brief
survey of those categories that are not covered or only partially covered in this
work.

The chapter is organized as follows. In section 1 we discuss the difference
between inflectional and lexical categories, review the notion of clitic, and
dissect the traditional typological parameters of morphology, i.e., phonologi-
cal fusion, flexivity, and semantic density (exponence, synthesis). Sections 2
to 6 are devoted to further parameters of typological variation: the place and
position of inflectional markers, paradigm and template structure, and obli-
gatoriness of marking. In section 7 we briefly review the content of a few
inflectional categories, and in section 8 we summarize some of the ways in
which inflection interacts with syntax, concentrating on agreement and case
marking.

1   Formatives and morphological types

1.1   *Words versus formatives*

At the heart of inflectional morphology are what we will call *formatives*. For-
matives are the markers of inflectional information. (In (1) above, the endings
-e, *-es*, *-en*, and *–s* are all formatives.) They are different from *words* in that

they cannot govern or be governed by other words,[3] 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* versus *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 formatives 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 or 'light'), whereas independent words all follow a CVC or CVː syllable canon (i.e. they are bimoraic or 'heavy'). Case markers, unlike agreement prefixes, follow the pattern of words:

(3)   Lai Chin (Tibeto-Burman; W. Burma)
        Tsew Máŋ   niʔ   ʔa-ka-ṭhoʔŋ
        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 (*Tsew* and *Máŋ*). It is as if the rhythmical articulation of speech goes its own ways – ways that are quite distinct from the conceptual and syntactic segmentation, in which for instance *Tsew Máŋniʔ* is a single, indivisible unit (a single grammatical word, as we will see).

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 1 and 6 of this volume. Another common instance of

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[3] We use the term *govern* in the traditional sense of determination by one word of the grammatical form (i.e., the 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. In contrast to agreement, the governed category is not contained in the governing word: contrast (1) above, where the gender is contained in the head noun that triggers gender agreement (*Lehrer* is masculine, *Lehrerin* feminine).

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*[4] 'from friend:GEN.SG' is realized as [ad'drugə], just as the single-word expression *otdaj* 'give back' is realized as [ad'daj]. That prepositions are grammatical words on their own, however, is still evident from the fact that they govern case, cf. *ot=druga* 'from (the/a) friend', with 'friend' in the genitive, versus *s=drugom* (phonetically, ['zdrugəm]) 'with a friend' where 'friend' is in the instrumental case. Yet another instance of a phonologically bound word arises from incorporation, to which we will briefly return below.

   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. See Hopper and Traugott (1993) and Lehmann (1995) for surveys of grammaticalization phenomena.

1.2   Clitics

As we saw in the preceding section, the word versus formative distinction is a purely syntactic one and crosscuts the phonological difference between free and bound units. The traditional notion of a word 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 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 without qualification. '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*,

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

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-PAST-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 *a guy you* [V *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 are boldfaced):

(4)   Kâte (Finisterre-Huon; Papua New Guinea; Pilhofer (1933))
        a. [NP e=le   **fi**ʔ]=ko   mi   fe-naŋ!
                3SG=DEST house=ADL NEG climb-1PL.HORT
            'Let's not climb into HIS house!' (p. 113)

        b. [NP ŋiʔ   **moʔ-mo**ʔ=**sawa**]=tsi   e-mbiŋ
                man INDEF-INDEF=RESTR= ERG do-3PL.REM.PT
            'Only some of the men did it' (p. 110)

        c. [NP ŋiʔ wiaʔ **e-we**ʔ]=tsi   dzika ki-tseyeʔ
              man thing do-3SG.REM.PT=ERG sword bite-3SG.REM.VOL
            'The man who did these things should be killed'
            (literally 'should bite the sword') (p. 142)

In (4a), the adlative =*ko* is cliticized to a noun; in (4b), the ergative =*tsi* is attached to an indefinite pronoun which already hosts another clitic (=*sawa* 'only'); and in (4c), we find the same ergative marker on a finite verb form, indicating the function of the internally headed relative clause.[5]

Another common type of phrasal clitic is bound articles (determiners, specifiers) that attach not only to nominals but also to verb forms, where they function as nominalizers or relativizers. This phenomenon is particularly common in many North and Central American languages.

Phrasal clitics typically have scope over the whole NP they are attached to, i.e. they modify the whole NP expression although formally they are not copied

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[5] See vol. II chapter 4 for more on relative clauses.

onto each element. The ergative in (4c), for example, specifies that the whole expression 'man who did these things' is an agent, but, formally, the ergative appears only on the last element (*ewe?* 'did'). Phrasal scope is an important issue in NP morphosyntax and we will return to it in section 8.2. 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 analyse the category structure of the language. An element is a clitic only if it can attach to hosts of diverse categories.

In all of the preceding examples of clitics, they 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* 'subject', =*xa* 'object', =*sa* 'instrumental') and determiners (=*da*) regularly attach to the preceding phrase:

(5)   Kwakw'ala (Wakashan; NW America; S. R. Anderson (1985b))
        nep'id=i=da   gənanəm=xa gukʷ=sa   t'isəm
        throw=SUBJ=DET   child=OBJ   house=INSTR rock
        'The child threw a rock at the house'

Here the instrumental formative on 'rock' is cliticized to 'house', whose object marker is in turn cliticized to the preceding word 'child'. While uncommon, such patterns are also occasionally attested in Australian languages (Evans (1995b)).

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 (6). If the clitic attaches to an NP, that NP is focussed (indicated by small caps in the translation). If the clitic follows the verb, the entire proposition is focussed.

(6)   Tsakhur (Nakh-Daghestanian; NE Caucasus; Kibrik (1997:306))
        a. MaIhaImaId-eː Xaw   alya?a =wo=d
           M.-ERG   house(IV):NOM build   =AUX=IV
           'Muhammed is building a house'
        b. MaIhaImaId-eː Xaw   =wo=d   alya?a
           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 the Tibeto-Burman language Belhare, where the reported speech marker =*phu*/=*bu* can occur after any part of speech in the clause, sometimes even on two at once (Bickel (2003)). 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:

(7)   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 tradition-ally called the *Wackernagel position* (named after the famous Indo-Europeanist who first described the phenomenon in 1892). This position is especially com-mon 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 subconstituent of it. This is characteristic, for instance, of South Slavic, Wakashan, and many Uto-Aztecan languages:

(8)   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'

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[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 8.2 for further discussion.

In (8a), the tense- and agreement-indicating clitic =*up* attaches to the first NP, in (8b) to the first subconstituent of this NP. Example (8c) 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 subconstituents of phrases. In Warlpiri, a Central Australian language, clitics occur after the first complete syntactic phrase:

(9)   Warlpiri (Pama-Nyungan; C. Australia; Hale, Laughren, and Simpson
       (1995); 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 constituent (NPs in (9a,b), a verb in (9c)), but it would not be possible for the clitics to follow part of a constituent, e.g. *kurdu* 'child' or *jarntu* 'dog' alone in (9a) and (9b), respectively.

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

(10)   Nuuchahnulth (Wakashan; NW America; Nakayama (1997))
       a. hin=aːčiƛ   [DP minwaːʔath=ʔi] (p. 190)
          there:MOM=go.out.to.meet   British.soldier=DEF
          'They went out there to meet the British soldiers'

       b. ʔu-chi=nƛ   [DP ƛuɬ=aq=ak=ʔi   ḥaːkʷaːƛ] (p. 107)
          her-married.to=MOM   nice=very=DUR=DEF girl
          'He got married to the very beautiful girl'

Since in (10a) the head noun *minwaːʔath* 'British soldier' is the only word in its DP, the article cliticizes to this word. In (10b), however, the article is found on the preceding modifier *ƛuɬ=aq=ak* 'very nice' because this is now the first

word in the DP. (Note, incidentally, that the pattern is the same on the clause level: aspectual formatives like =nʌ̃ 'momentaneous' and entire words like =aːči̋ '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*:

(11)   Bete (Kru; Ivory Coast; Marchese (1986:197))
         ná   dībà   nìfl   lī   kɔ̀kɔ́
         my father NEG   eat   chicken
         '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 (S. R. Anderson (1992:204)). As illustrated by the following example, pronominal 'clitics' like *siya* 'he' are fixed in their Wackernagel position:

(12)   Tagalog (Schachter and 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 (see (11) above) reduces to a high tone clitic, which triggers vowel lengthening so as to have a place for realization (i.e., ɔ= ꞌ is realized as ɔɔ́).

(13)   Bete (Marchese (1986:197))
         ɔ=ꞌ   nímʌ́
         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:

(14)   Toura (Mande; Ivory Coast; Bearth (1971))
     a. nɛ́   ké   ló-ìī̄   boí
        child IND go-PROGR field
        'The child is going to the field'

     b. nɛ́=ˋ   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 (14a), are phonologically free. Others, e.g. the 'actual' ('ACT') mood marker in (14b), are tonal clitics. After pronominal subjects, mood-indicating formatives are completely fused with their host (14c): compare *kó* 'we (optative)' in (14c) with such forms as *kwéé* 'we (actual, resultative)' or *kwéè* 'we (actual, ingressive)'.

1.3   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 here to set up a scale of phonological fusion:[7]

(15)   Fusion
     ISOLATING > CONCATENATIVE > NONLINEAR

1.3.1   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 (3) 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 (conveying such notions as the source of evidence or the firmness of assertion).

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[7] The scale is also useful in derivational morphology, cf. chapter 1 in this volume.

1.3.2   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 seg-
mentable. 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 for-
mative is a clear cut sequence of phonological segments. In this regard, concate-
native formatives are similar to isolated (independent) formatives. However,
unlike these, concatenative formatives trigger some phonological and mor-
phophonological adjustments in the word they build up together with their
host – and the more such adjustments there are, the tighter the degree of fusion.
In Turkish, a well-known phonological adjustment is *vowel harmony*: when the
stem vowels have front instead of back articulation, the affixes follow suit: cf.
el-ler 'hand-PL', *el-in* 'hand-GEN', *el-ler-in* 'hand-PL-GEN' versus *ad-lar, ad-ın,
ad-lar-ın* just above.

Another, cross-linguistically very frequent, concomitant of concatenative
morphology is *assimilation*. This involves the spreading of phonological fea-
tures 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-PAST' versus *gel-di* 'come-PAST'.

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; cf., e.g., *khaʔ-yu* 's/he'll go' from *khat-* 'go' and *-yu*
'NONPAST'.

Another process sometimes affecting concatenative formatives is *elision*.
In Turkish, for example, stem-final /k/ is deleted in polysyllabic words 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 exam-
ple, /i/ regularly deletes before /u/, cf. *-chi-u → ch-u* in *tar-he-**ch-u**-ŋa*
'bring-PAST-DU-3P-[1]EXCL', i.e. 'we (two, without you) brought it', with
plain *-chi* in *ta-he-**chi**-ŋa* 'come-PT-DU-[1]EXCL', i.e. 'we (two, without you)
came'.

A final type of effect to be noted results from general *prosodic con-
straints*. Often, epenthetic elements are inserted when the concatenation of
an affix would result in a structure that violates the language's syllabic

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[8] An alternative term is *agglutinative*, but, as we will see in section 1.4 below, this term traditionally
has connotations that go far beyond phonological boundness. We avoid the simpler term *bound*
because it is already functionally overloaded in other parts of grammatical description.

templates. In the Austronesian language Lenakel (spoken in Vanuatu), for exam-
ple, 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
rɨva '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-TEMP', i.e., 's/he is coming' versus *ta-hett-i* 'come-TEMP-1PL',
i.e., 'we are coming.'

1.3.3   Nonlinear
Despite (morpho)phonological adjustment rules that blur formative boundaries,
concatenation results in linear strings of segmentable affixes. Nonlinear forma-
tives, in contrast, are not segmentable into linear strings but are instead realized
by direct modification of the stem, i.e. by a simultaneous realization of formative
and stem. The best-known instance of this is morphology in Semitic languages.
In Modern Hebrew, for example, inflected word forms are the result of super-
imposing on a consonantal skeleton (e.g. *g-d-r* 'enclose') various vocalisms
indicating tense, mood, or voice: e.g. *a-a* 'active' (*gadar* 'he enclosed') ver-
sus *u-a* 'passive' (*gudar* 'he was fenced in'), or *-o-* 'future, imperative' (*gdor*
'enclose it!') (Glinert (1989)). Similar in nature but more common is the super-
imposition 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: cf. conjunctive *múkora* 'that we work', relative *mukorá*
'which we work (at)', and 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' versus *bùrê* 'cats', or *láŋô* 'Lango' versus
lə́ŋí 'Langos'. This is sometimes accompanied, as the latter example shows,
by tonal substitutions and ablaut. In Ute (Uto-Aztecan; Givón (1980)), substi-
tution of an individual phonological feature is recruited for case marking, cf.
nominative *ta'wáci̥* 'man' with devoicing of the final vowel versus accusative
ta'wáci 'man' without devoicing.

Still another type of nonlinear 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', *ʔeipig* (IPFV) vs *ʔeip* (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. (In some cases, a side effect of this is compensatory lengthening of the root vowel.)

A final type of nonlinear 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 analysed 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 and Prince (1995)), reduplication would be a (very tightly fused) concatenative affix rather than a nonlinear 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. The degree of fusion is not as high, however, as with the other subtypes of nonlinear fusion, and on the scale of fusion in (15), reduplication holds a position between concatenative and nonlinear 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 nonlinear 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 nonlinear 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 nonlinear, as a whole, than, say, Turkish, which has only rudimentary and non-productive traces of nonlinear morphology borrowed from Arabic (Lewis (1967: esp. 27f.)).

1.4   *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 nominative singular formative is -*s* after most nouns, but some nouns select an ending in -*m* (most of what are called the neuter *o*-stems) and yet other nouns have a zero ending (the *a*-stems, among others); cf., e.g., *diē-s* 'day' versus *vīnu-m* 'wine' versus *poēta-ø* 'poet'.

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* '(I) carry', second person singular present *trägst* '(you) carry', and third person singular past *trug* '(s/he/it) carried', 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 3.1. Verbs of conjugation class ɪɪ (e.g. *dzeːni* 'to speak' in table 3.1) have one stem form in the first person singular and another one in the first person dual and plural non-past. Verbs of class ɪɪɪ (e.g. *botni* 'to 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 ɪᴠ (e.g. *lɨni* 'to 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 4.1.

The hallmark of flexive formatives is that their variation is item-based, i.e. allomorphs are selected by some lexical contexts but not others. Some

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[9]   The original, nineteenth-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.

Table 3.1 *Dumi nonpast verb inflection (selection)*

	II: *dze:ni* 'speak'	III: *botni* 'shout'	IV: *lɨnɨ* 'commence'
1SG	*dze:-tə*	*bus-tə*	*lo:-tə*
1DU.INCL	*dzi:-ti*	*bus-ti*	*lu-ti*
1DU.EXCL	*dzi:-tɨ*	*bus-tɨ*	*lu-tɨ*
1PL.INCL	*dzɨ:-kɨtɨ*	*boʔ-kti*	*lɨ-kti*
1PL.EXCL	*dzi:-kta*	*boʔ-kta*	*lɨ-kta*

stem forms are selected by one formative but not another, 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 is due to general morphophonology or phonology: examples are Turkish vowel harmony and Belhare dissimilation, discussed in section 1.3.2 above. Note that the distinction between flexive (item-based, allomorphic) and nonflexive (general, morphophonological) variation is independent of whether the variation-triggering context is defined morphologically or phonologically (see Kiparsky (1996)). Examples of morphologically triggered allomorphy were discussed in the preceding paragraphs. An example of phonologically triggered allomorphy comes from Warlpiri. 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 phonological rule that systematically associates the number of syllables with the choice between /ngk/ and /rl/; the variation depends on a binary division of the lexicon into two inflectional classes, and the formative is thus flexive.[11]

Since the nineteen century, morphological typology has tended to integrate these various differences into a single scalar hierarchy:

(16)   isolating > agglutinative > flexive > nonlinear (or introflexive)

These have generally been presented as whole-language typologies, with prototypical examples probably being (respectively):

(17)   Chinese > Turkish > Latin > Arabic

[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 defined inflectional class distinction is common in many Australian languages. Examples from Papuan languages are discussed in detail by Aronoff (1994).

This scale conflates the concatenative/nonlinear and flexive/nonflexive parameters. 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 all are equally common. The commonest combination is *flexive–concatenative* (and the traditional 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 (morpho-)phonological rules. Latin case declension, for example, shows various patterns of assimilation and elision. Thus, the Latin nominative singular allomorph *-s* triggers regular (pan-lexical) voicing assimilation (e.g. *leks* 'law' from *leg-s*), vowel raising (*lupus* 'wolf' from *lupo-s*), and simplification of consonant clusters (*dens* 'tooth' from *dent-s*). Likewise, Dumi stem–suffix boundaries are subject to various morphophonological adjustments (van Driem (1993):91–5)): an example in the paradigm selection in table 3.1 is the stem-final glottal stop in *boʔkti* 'we (incl.) shout' and *boʔkta* 'we (excl.) shout' which is a regular morphophonological variant of /t/ before /k/ (cf. infinitive *bot-ni* 'to shout').

Flexive–nonlinear 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 much of the allomorphy of agreement and tense–aspect morphology. In Modern Israeli Hebrew (Glinert (1989); Aronoff (1994); Orin Gensler (p.c.)), for example, the past versus future opposition is expressed by different vowel and consonant alternations dependent on the binyan (as well as on subclasses of these): cf. *gadar* 'he enclosed' and *yi-gdor* 'he will enclose' in the first binyan versus *kipel* 'he folded' versus *ye-kapel* 'he will fold' in the second binyan. In the first (subclass of the first) binyan, past is characterized by *a-a* and future by *-o-* vocalism, while in the second binyan, past has *i-e* and future *a-e* vocalism. In addition to this, there is allomorphy of the agreement prefixes in the future tense: *yi-* in the first, *ye-* in the second binyan. (In the past tense, third person masculine agreement is zero-marked.)

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 in Australia. Yidiɲ 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 two allomorphs, *-ŋa* ∼ *lmaŋa*. The disyllabic allomorph is selected by what are called *l-* and *r-*stems, and it commences its own phonological word, cf., e.g., [_word_'magil][_word_ ma'ŋaːl] 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], which is reduced to [ma.ŋaːl].

Another example comes from the Mesoamerican language Sierra Otomí, in which tense–aspect, person, and sometimes deixis are marked in a phonologically free formative that precedes the lexical verb word. These formatives show flexivity conditioned by four lexical classes of verbs:

(18)   Sierra Otomí (Otomanguean; Mexico; Enrique Palancar (p.c.), from Voigtlander and Echegoyen (1985))

      dí   pӗʔtsʔi   'I keep (it)' (conjugation class I)
      dín   nú   'I see (it)' (conjugation class II)
      dídí   hóki   'I fix (it)' (conjugation class III)
      dídím   pɛ́pfi   'I work' (conjugation class IV)
      1SG.PRS [verb]

NONFLEXIVE ISOLATING: Nonflexive formatives are often isolating; and the most common type of isolating formative is nonflexive. An example is case in Lai Chin as in (3). In Lai Chin there is no allomorphic variation for the ergative marker *niʔ*; it is the same for any noun in A function.

NONFLEXIVE CONCATENATIVE: 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 1.3.2.

NONFLEXIVE NONLINEAR: Finally, nonflexive nonlinear formatives are common with suprasegmental (tonal or accental) morphology. An example is Kinyarwanda tense and mood inflection, as discussed in section 1.3.3.

In the discussion of fusion, we noted that languages sometimes use concatenative techniques for some categories and nonlinear 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.

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[12] The suffix has an applicative function, turning a comitative NP into a direct object. Dixon classifies this form as derivational, but on our criterion it is inflectional because its occurrence is an obligatory response to at least some syntactic environments. An example where *-ŋa* is used in response to such an environment appears in (63) below.

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]

1.5   *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 the question of the *semantic density* of formatives. However, there is no logical necessity for flexivity or, for that matter, phonological fusion (concatenative versus nonlinear) to covary with semantic density (cf. Plank (1999)). There are two dimensions of semantic density that need to be distinguished. 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, chapter 2 in this volume.)

1.5.1   *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, where number and case, for example, are most often cumulated 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), where there is no correspondence whatsoever between categories and parts of formatives (segments), i.e. no part of, say, genitive plural *-ov* that can be identified with genitive case or plural number. A concept related to cumulative formatives is *portmanteau* formatives. Like cumulative formatives, portmanteau formatives express more than one category, but each of the categories expressed corresponds to a separate formative that also exists in the language. For example, the French portmanteau form *du* 'of the' has corresponding formatives *de* 'of' and *le* 'the'. By contrast, there are no case-only or number-only formatives corresponding to the cumulative genitive formatives of Russian.

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.

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

-*in*, GEN. PL. -*ler-in* (all with vowel-harmonic alternations). There is some tendency for nonflexive concatenative ('agglutinative') morphology to go with separative exponence as in these Turkish examples and for flexive formatives to be cumulative as in Latin or Russian, 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 nonpast tense separately 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) formatives cumulating person agreement and tense/aspect/mood values. This is illustrated for Hausa with two examples in the completive aspect:

(19)   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   macìjî-n?
      children 3PL.COMPL   see   snake-ART.PL
      'Did the children see the snake?'

1.5.2   *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 simple (*he*), 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 Yidiɲ and Sierra Otomí examples in section 1.4, 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 1.1, however, the relationship between preposition and noun is still one between independent grammatical words.

Analytic words comprise just one or a very limited number of formatives or they comprise just one lexical root. Examples are the words *he* (one pronominal root and one nominative case formative) and *worked* (one lexical root and one past tense formative) we looked at just before. Sometimes analytic words 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 (*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 phrase-heading expressions (*He will definitely go*). (Note that analytic words can be phonologically bound: English auxiliaries typically cliticize to preceding words (*he'll go*). They are no less grammatical words for being phonologically bound, however.)

Words such as the auxiliary *have* in English, which comprises 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. An example of this is found in Russian verb forms like *vyp'et* 'will drink', which express tense (future), aspect (perfective), person (third), and number (singular). 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 (20), which includes no less than ten formatives suffixed to the stem *tan-* 'know'.

(20)   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'
        (literally, '[it] is from their not being able to be made known to each
            other')

Synthetic words mostly involve bound (concatenative or nonlinear) forma-
tives, 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 Southeast Asian and
East Asian languages form a single grammatical word together with the lexical
root they modify. In Lai Chin, for instance, formatives indicating agreement,
tense and mood are phonologically free, i.e. isolating, but any sequence of a
verb and one or more of these formatives constitutes a single, uninterruptible
word from the point of view of syntax:

(21)   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), and this contrasts with the relatively free ordering of gram-
matical words in Lai Chin sentences. Moreover, the third person plural object
agreement marker *nhaa* is obligatory and is in direct opposition with the first
person plural object agreement marker which is a phonologically bound prefix
(*kan-*). Further, as shown by the contrast in (22), no phrasal constituent can
intervene:

(22)   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 facts 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 English 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 as shown in section 1.1 above.

While synthetic forms comprise only formatives and one lexical word (the stem), matters are different with polysynthesis, which brings together not only formatives but also incorporated stems and lexical affixes into a single grammatical word (an X^0 in phrase structure). 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 Siberia and Papua New Guinea, respectively:

(23)   Telqep Chukchi (Chukotko-Kamchatkan; Siberia; Dunn (1999))
        utt-ən-ejmew-jəw-ə-ninet=ʔm
        wood-CAUS-approach-COLLECTIVE-EPEN-3SG.A:3PL.P=EMPH
        'He brought them wood'

(24)   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 like 'wood' or 'at night' are expressed by bound morphology.

Polysynthesis often involves grammatical words that are phonologically coherent, but, as with synthesis, not necessarily. Indeed, unlike the Chukchi example in (23), a Yimas string like the one in (24) consists of several phonological words,[14] defined by stress and allophone distribution (Foley (1991:80–7)), but the string nevertheless forms a single grammatical word in syntax (i.e. a V^0 or minimal projection constituent). Its grammatical 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 formatives. The first person paucal pronoun, for example, is incompatible with the paucal suffix because the pronoun projects its own analytic grammatical word. (First person

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[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.

reference is expressed periphrastically for first person paucal, compensating for the lack of a corresponding synthetic form.)

(25)   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 was therefore one of syntactic agreement. By analogy, one could then argue that -ŋkt appears in (24) above because of agreement with *paŋkra-*; the relationship between these two elements would then be a syntactic relationship holding between two distinct grammatical words. A case could then be made for analysing the expression as analytic. But the fact is that the distribution of -ŋkt is not governed by agreement between grammatical words but is instead subject to morphological rules that are operative within, rather than across, grammatical words.

   One of the typologically most important characteristics of polysynthesis is that pronominal and even lexical arguments are incorporated into their governing verb. The Yimas words in (24) and (25) exemplify incorporated pronouns: in (24) the first person paucal prefix *paŋkra-* functions as an affixed subject pronoun. In (25), the second person dual prefix -ŋkul functions as an incorporated object pronoun, while the subject pronoun *paŋkt* 'we few' is not incorporated. The Chukchi example in (23) illustrates incorporation of a lexical argument. The direct object *utt-*'wood' is incorporated into the verb (as a regular response to low discourse saliency of the object; see Dunn (1999)). Incorporated elements are no longer grammatical words heading their own constituents in the clause. They typically lose many of their syntactic abilities and could thus be called *semi-words*. We will briefly come back to pronoun incorporation in our discussion of agreement systems in section 8.

2   Locus

Locus is the term we propose for what has been known as head/dependent marking (Nichols (1992)). The essential distinction can be illustrated by examples from Hungarian and English (the relevant formatives are in boldface):

(26)   Hungarian (Uralic)
         az   ember ház-**a**
         the man   house-3SG
         'the man's house'

(27)   English
         the man-**'s** house

In both of these, the possessed noun 'house' is the syntactic head of the construction and the possessor is non-head. Hungarian puts an inflectional suffix on 'house' (the head) while English puts it on the possessor. The Hungarian inflectional suffix is a possessive suffix which agrees in person and number with the possessor; the English one is a case clitic and not an agreement marker. As these examples show, the syntactic relation of adnominal possession can be reflected by placing a formative on either the head or the non-head of the phrase. The inflectional categories differ, but not because the syntactic relation they reflect differs; rather, certain inflectional categories have affinities for one or another locus. Person and number, for instance, are almost always on heads and almost always due to agreement, while case is on non-heads and is not always (and in fact not often) due to agreement.

The locus of marking can be not just on the head or the non-head, but also on both or on neither. The following examples give some idea of the variety of locus types and the variety of inflectional categories that mark them, using possessive NPs (Nichols (1992:49ff.)).

On head (HEAD MARKING):

(28)   Tadzhik (Indo-European; J. R. Payne (1980:167–8))
        xona-i   padar
        house-EZ father
        'father's house'

(29)   Abkhaz (West Caucasian; Hewitt (1979:116))
        à-čʼk°'ən yə-y°nə̀
        ART-boy   3SG-house
        'the boy's house'

In (28), the formative *-i* on the head noun 'house' indicates that there is a dependent present in the NP but that it does not agree with it. This construction is known as *izafet* or *ezafe* in the grammatical traditions of many Turkic and Iranian languages (and glossed here as 'EZ'). In (29), 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, the Himalayas, and the Americas. For more on possessor agreement, see sections 4.1 and 8.1 below.

On dependent (DEPENDENT MARKING):

(30)   Chechen (Nakh-Daghestanian; Caucasus)
        dee-$^{\text{n}}$ aaxcha
        father-GEN money
        'father's money'

On both (DOUBLE MARKING):

(31)   Nogai (Turkic; Baskakov (1963:539)):
        men=im   kullyg-ym
        1SG=GEN   work-1SG
        'my work'

On neither (JUXTAPOSITION):

(32)   !Kung (Khoisan; S. Africa; Snyman (1970:92)):
        dz'heu   ǂxanu
        woman   book
        'woman's book'

On neither (DETACHED MARKING):

(33)   Tagalog (Austronesian; Philippines; Schachter and 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 (10) in section 1.2). We call this marking DETACHED
because the clitic is not attached to either the head (*libro* 'the book') or the
dependent (*nasa mesa* 'on the table'). It is placed between the two.

   Marking can also be split. Many languages use two different loci of marking
to implement what is often termed 'alienable' versus 'inalienable' possession.
The 'inalienables' are often nouns such as kin terms and body parts (called
'inalienable' because they typically cannot be sold or given away) and the
'alienables' are the rest. It is common for 'inalienable' possession to be head-
marked and 'alienable' not, as in (34):

(34)   Amele (Madang; New Guinea; Roberts (1987:139)) ('mouth' and
        'son' are inalienable)
        a. ija   na   jo
           1SG   of   house
           'my house'
        b. Naus na   jo
           N.   of   house
           'Naus's house'

    c. ija   co-ni
       1SG mouth-1SG
       'my mouth'

    d. Naus mela-h-ul
       N.   son-3SG-PL
       'Naus's sons'

or for 'inalienable' possession to have no marking and 'alienables' to have case marking or the like:

(35)   Dyirbal (Dixon (1972:61, 105))
      a. balan ḍugumbil mambu   [inalienable]
        DET   woman   back
        'the woman's back'

      b. bayi waŋal   baŋul   yaṛa-ŋu [alienable]
        DET boomerang DET.GEN man-GEN
        'the man's boomerang'

The different locus types can also be distinguished in the marking of clause relations. Here are examples of languages that mark the relations of subject and object only on the verb (head marking, as the verb is the head of the clause):

(36) Abkhaz (West Caucasian; Georgia; Hewitt (1989:67))
     a-pᵒʷəs   a-χ ac'a a-χ arp   Ø-yə-zə-lə-ʒʒʷa-yt'
     DET-woman DET-man DET-shirt 3SG.P-3SG.M.IO-for-3SG.F.A-wash-AOR
     'the woman washed the shirt for the man'

only on the arguments (dependent marking, as the arguments are the dependents):

(37)   Martuthunira (Dench (1994:75))
      ngayu   tharnta-a nhuwa-lalha parla-ngka
      1SG.NOM euro-ACC spear-PAST   hill-LOC
      'I speared a euro in the hills'

on both:

(38)   Belhare
      unchik-ŋa yeti   n-thuu-t-u?
      3NSG-ERG what.NOM 3NSG.A-cook-NPT-3P
      'What do they cook?'

and on neither:

(39)   Thai (Jenny (2001), from a popular Thai song)
        phruŋ^{2}nii^3 chan^4 cə   rak^3 khun təlɔɔt^1 pai
        tomorrow 1FAM PROSPECTIVE love 2HON whole CONTINUATIVE
        'Tomorrow I will love you forever'

Certain grammatical categories favour 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.

(40)   Georgian (Kartvelian; Caucasus)
      a. v-xedav
          1SG.A-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 with case names: ABS = absolutive and ERG = ergative.

(41)   Jacaltec (Mayan; Mesoamerica; Craig (1977:122, 111))
      a. x-Ø-haw-il   naj
          ASP-ABS.3-ERG.2-see 3SG
          'You saw him'

      b. xc-ach   w-abe
          ASP-ABS.2 ERG.1-hear
          'I heard you'

3   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 3.2 expands this terminology somewhat. Latin prepositions or truncated adverbs label the position categories. Types that may not be self-evident or have not been illustrated earlier are explained and exemplified in what follows.

Table 3.2 *Typology of positions and formatives. * = example below 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 1.3.3 for illustration)
In	Substitution (cf. section 1.3.3)
	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 1.3.3)
	Prosodic formatives (cf. Kinyarwanda example in section 1.3.3)
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 1.2 and 2 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.

(42)   Yapese (Austronesian; Dryer (1989:868) from J.T. 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'

ENDOCLISIS A clitic inserted into a word constitutes endoclisis. The phenomenon is rare, but well documented for Udi by Harris (2000). In (43), 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):

(43)   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 a typologically and historically distinct
subtype of infixation. In general, infixation places formatives into a phonolog-
ically or prosodically defined environment (e.g. after the stem's onset conso-
nant(s), or after the first syllable), but in the case of interposition, the envi-
ronment is more nearly morphological, reflecting morphologized infixation
or petrified derivational morphology or compounding. Interposition typically
involves formatives placed between the two parts of a *bipartite stem*. A bipartite
stem is a stem where only part, but not the whole, is the target of morphological
rules (affixation, reduplication, mutation, particle hosting, etc.), and the location
of the boundary between the two parts is morphologically defined, i.e. neither
semantically (e.g., by scope as in the juxtaposition of independently inflected
stems) nor phonologically (e.g. by syllable structure as with infixation) (Jacob-
sen (1980); DeLancey (1996, 1999)). Interposition in verb stems is particularly
well known in languages spoken in the American Pacific Northwest, but it is
also attested in various Caucasian and Himalayan languages:

(44)   Washo (Jacobsen (1980))
         suʔm-tᵉ-íti?
         throw-PL-down
         'to throw down repeatedly'

(45)   Andi (Nakh-Daghestanian; Caucasus; Gudava (1959:197))
         a-b-ch-o
         wash-GENDER.AGREEMENT-wash-PAST
         '(I/you/he/she/we/they) laundered, washed (it)'

(46)   Belhare[15]
         a. la-ŋŋ-u-yakt-he
            dance-3NSG.S-dance-IPFV-PAST
            'They were dancing'

         b. tha-tok-ka-tok   n-ca-he   (< tha-tok- 'to know s.o.')
            know-know-RECIP-know 3NSG.S-AUX-PAST
            'They knew each other'

---

[15] Phonologically, these strings bracket into two or more prosodic words: ['laŋ]['ŋuyakthe],
['tha]['tokka]['tok], but, syntactically, they are indivisible wholes, i.e. single grammatical words;
cf. the discussion of synthesis in section 1.5.2.

In all these examples a formative is affixed only to the second part of the stem. In (46b), we find in addition, a process of reduplication affecting only one part of the stem (*tok-*). Sometimes, the two parts of bipartite stems have independent meanings and the properties of independent verb stems, as in the Washo example, where *šuʔm* means 'throw' and determines the transitivity of the complex, and *ítiʔ* means 'down' and shows the morphophonological behaviour of independent stems. But despite its position on only one stem part, the plural affix has scope over both parts simultaneously, and the stem as a whole behaves as a single grammatical word (a terminal node) in the syntax (see Jacobsen (1980)). The elements *ach-* 'wash' in Andi and *lau-* 'dance' in Belhare are simplex expressions that cannot be further analysed into component parts, at least not synchronically.

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-* occurring 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.)

S I M U L F I X A T I O N : 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 most common 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 (*-ŋa* and *-ha*) are postposed:

(47)   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*).

(48)   Lak (Nakh-Daghestanian; Caucasus; Zhirkov (1955:93, 1962:418))
         a. b-u-v-na
         b. d-u-r-na

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

The Limbu example used above to illustrate interposition (*ku-deːʔl-ku-bhuŋ* 'his/her clothes') also illustrates simulfixation: it has one token of the possessive formative preposed and one interposed into a bipartite stem.

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 analysed as prefixation under prosodic constraints against closed syllables (see McCarthy and Prince (1995), and Crowhurst (1989) for critical discussion): cf. *um-ibig* 'love' versus *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*).[16]

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:

(49)   Kubachi Dargi (Nakh-Daghestanian; Magometov (1963:76))
        a. b-eːn-ka-b-išši-j
           GENDER-in-down-GENDER-go-INF
           'insert, put in' (B gender)

        b. w-eːn-ka-w-išši-j
           GENDER-in-down-GENDER-go-INF
           'go in' (W gender)[17]

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

4   Paradigms

Inflectional systems are typically organized into *paradigms* of variable size, ranging from, e.g., the two-member paradigm of English verb agreement, with third person singular versus everything else (e.g. *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 (see section 1.5.1).

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[16] Following standard conventions, 'σ' stands for syllable and the parentheses are syllable brackets.

[17] 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.

Table 3.3 *Latin noun paradigms*

	'wolf'	'war'	'road'	'foot'	'attack'
Singular:					
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*	–

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. Case inventories and the terminology for them will be discussed briefly at the end of this section.

4.1   Inflectional classes

Case paradigms are paradigms *par excellence* and display most of the important properties of paradigms. Tables 3.3 and 3.4 show Latin and Chechen case paradigms, respectively. (Gaps in some of the Latin paradigms illustrate defectivity, discussed below.)

The Latin nouns shown in table 3.3 fall into distinct declension classes based on the stem-final (traditionally, 'thematic') vowels (*-u∼-o* vs *-a* vs *-u*) or consonants (*-d* in *ped-* 'foot') and the considerable allomorphy of the endings (e.g. nominative singular *-s* vs *-m* vs zero). The Chechen nouns in table 3.4 have mostly the same endings but considerable variation of stems. The noun 'daughter-in-law' has stem ablaut, and most nouns have stem extensions 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 extension, absent in the nominative, ergative, and (synchronically, though probably not diachronically) allative. Extensions are lexically conditioned and carry no meaning (though they may have their origins in frozen derivational or inflectional suffixes). The Chechen system of extensions

Table 3.4 *Chechen noun paradigms (all-Latin no-diacritics transcription; see http://socrates.berkeley.edu/~chechen for this transcription)*

	'window'	'daughter-in-law'	'mother'	'grief'	'pig'
Singular:					
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

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* in 'wolf'; -*a*, -*am*, -*ae*, -*ā* in 'road'; -Ø, -*em*, -*is*, -*ī*, -*e* in 'foot', etc.). In fact, though, there are two sets of differences, one resulting from the vowels (traditional 'thematic vowels') that expand the word stem (-*u* ~ -*o* in 'wolf' vs -*a* ~ -*ā* in 'war' vs Ø in 'foot' vs -*u* in 'attack') and one resulting from differences in the endings themselves (e.g. 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 extensions; 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

Table 3.5 *Typology of inflectional classes*

Stem	Formative:		
	Lexeme-based allomorphy	Category-based allomorphy	No regular allomorphy
Lexeme-based allomorphy	Latin nouns	Latin and Polish verbs	Chechen verbs, nouns, Dumi verbs (1.4)
Category-based allomorphy	[unattested in our sample]	Newar verbs	Belhare verbs
No regular allomorphy	Polish nouns, Anêm possession	Germanic weak verbs, Ossetic sg./pl. case	Finnish nouns

Table 3.6 *Belhare verb paradigm (selection). The* k~g *alternation in* yak- *and* -ka *is morphophonologically conditioned;* -ʔ *and* -yu *mark nonpast (the allomorphy is determined by prosodic structure),* -he *past,* -ŋe *resultative, and* -kone *inconsequential*

	nonpast	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*

inflectional categories but general across all lexemes; and no allomorphic variation.

LEXEME-BASED ALLOMORPHY OF STEMS, OR STEM CLASSES Stem classes are present when stems differ (because of ablaut, stem extensions, 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 3.3 and 3.4 above. In Chechen, for example, the vowel ablaut in 'daughter-in-law', or the choice of stem extensions (-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 regular morphophonology such as vowel raising in the nominative singular *lupus* < *lup-o-s* or monophthongization in the genitive singular *lupī* < *lup-o-i*; see section 1.4 above).

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 3.6

Table 3.7 *Verb paradigms in Latin and Polish*

| | Latin 'love' | | Polish 'write' | |
	Present	Perfect	Present	Past
1sg	*amo*	*amāvi*	*piszę*	*pisałem*
2sg	*amās*	*amāvisti*	*piszesz*	*pisałeś*
3sg	*amat*	*amāvit*	*pisze*	*pisał*
1pl	*amāmus*	*amāvimus*	*piszemy*	*pisaliśmy*
2pl	*amātis*	*amāvistis*	*piszecie*	*pisaliście*
3pl	*amant*	*amāverunt*	*piszą*	*pisali*

shows how they are distributed over a selection of forms. The primary stem here is *yak-*, and the secondary stem *-yau* is derived from this by imposing a CVV syllable structure: the original root coda /k/ is vocalized while retaining its tongue and velum positions (i.e. its point of articulation and nasality/orality), e.g. *yak-* ∼ *yau-* 'stay overnight', *yaŋ-* ∼ *yaū-* '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 allomorphs *-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. For Finnish paradigms, see Eliot (1890:26ff.); Serebrennikov and Kert (1958); Branch (1987).

FORMATIVE CLASSES When inflectional formatives have lexeme-based allomorphy we have formative classes. For example, the Latin nouns shown above have different sets of endings.

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 3.7. In Latin and Polish, different agreement classes co-occur with differences in stem classes: while *amāre* 'love', a class I verb in Latin, 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 in table 3.7, but

Table 3.8 *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*

a smaller (though still large) class of verbs has *-i*: *lubię*, *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 all have the same set of case suffixes, and likewise for nouns in Hungarian, Turkish, and Basque. All variation there is phonologically or morphophonologically conditioned, i.e. the same across the (regular) lexicon.

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 (1987a), 1987b); 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 genitive *cāsūs*, *modus* 'mode' has genitive *modī*, and *genus* 'gender' has genitive *generis*; cf. table 3.8. Note that other case combinations, e.g. nominative and accusative, would not unambiguously identify the paradigms. 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

Table 3.9 *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–gender 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

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 typical 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 extensions (Thurston (1982:37–8)); cf. table 3.9 for illustration. This is lexeme-based flexivity of both formatives and stems, similar in kind to Latin case inflection: both the shape of the stem (with extensions -ø, -ng, -g, -d) and the shape of the formative depend on the particular lexical declension class of the root.

4.2 Syncretism

Every one of the Latin nouns in table 3.3 has at least one instance of syncretism, or falling together of case endings: an example is dative and ablative *lupō* of 'wolf'. Chechen has virtually no syncretism in its noun paradigms. Syncretism is sometimes an accident of sound change, 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 (1971a [1936], 1971b [1958]) assume that syncretism follows, and reveals, the basic structural components of case meanings such as markedness of categories (markedness is defined in section 5). An instance of syncretism to which

functional motivation is often attributed is the nominative–accusative syn-
cretism of neuter nouns in Indo-European languages (as in *bellum* 'war' in
table 3.3). 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 Dubois, Kumpf,
and Ashby (2003)); 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 proce-
dure yields the following order for Latin: Vocative, Nominative, Accusative,
Ablative, Dative, Genitive.

4.3   *Defectivity and suppletion*

Some words simply lack certain paradigmatic forms. Latin *impetus* 'attack',
in table 3.3 above, forms only a few of the cases (Rhodes (1987)). Bagvalal
place names, as mentioned in section 4.6 below, lack a nominative case. 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' with *wa-na-soma* 'they are reading'
but only *ha-wa-soma* 'they don't read, they are not reading'). Category-based
defectivity is not random; see Aikhenvald and Dixon (1998) for a preliminary
survey.

Gaps in paradigms are sometimes compensated for by (etymologically) dif-
ferent words. The lacking plural forms of Latin *impetus* 'attack', for example,
are frequently supplied by *incursiōnēs* 'attack'. When this is regular and oblig-
atory, 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 (e.g Latin nominative in *-s* vs *-m* vs *-∅*)
is usually called (lexical) allomorphy (cf. above).

4.4   *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 'deponent'.

Table 3.10 *Chechen deictic prefixes*

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

Corbett (2000a) and Baerman (2006) show 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 (Iroquoian) syntactic nouns with verb morphology such as *ra'swà:tha'* 'fireman' (lit. 'he extinguishes'); in Limbu and Belhare, a small number of syntactically transitive verbs are inflected as if they were intransitive, and vice versa. The Limbu verb form *mɛʔru* 's/he is fat', for example, is a regular transitive verb form indicating a third person singular actor (zero prefix) and a third person singular undergoer (*-u* suffix). But syntactically and semantically, this is an intransitive predicate (Michailovsky (1985, 1997); also cf. Bickel and Nichols (2001)).

4.5   Eidemic resonance

As pointed out by Hockett (1987), all morphology rests fundamentally on a basic notion of what he called 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 that they contain the 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*. This is the most straightforward example, but in addition the forms of a paradigm often resonate with each other through alliteration, rhyme, or other paronomasia without entailing any general and consistent semantics or morpheme extractability. 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 (e.g. French singular object pronouns *me*, *te*, *le*, *se*, which rhyme and have the same syllable structure), basic kin terms (e.g. *mama* and *papa*, with the same vowels and syllable structure and similar consonants: Jakobson (1941)), essential deictics (e.g. *this*, *that*, *there*, etc., as the only English words with initial /ð/), 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 3.10).

Table 3.11 *Warrgamay (Pama-Nyungan, Australia; Dixon (1980:287, 329))*

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

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, lack pharyngealization, and are an open set.

4.6   *Case inventories and case terminology*

Case 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 examples from Warrgamay in table 3.11 show the three possibilities in one language. The distribution of alignment across parts of speech is motivated by expectations of agency on the indexability hierarchy (Silverstein (1976); DeLancey (1981)). The higher a referent is on this hierarchy, e.g. *I* in contrast to *stone*, the more likely this referent is to be agent. Therefore there is less need of explicit agency-marking in the form of an ergative case (because agency is already expected), and at the same time more need of explicit patient-marking in the form of an accusative case (because patienthood is not expected). And, vice versa, the lower a referent is on the hierarchy, e.g. *stone* in contrast to *I*, the more there is a need for explicit ergative-marking (the unexpected role) but the less there is for explicit patient-marking (the expected role). As a result, high-indexable referents tend toward zero vs accusative marking and low-indexables toward ergative vs zero marking.

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:

(50)   'good'   'person'
          Nominative *dika*   *stag*
          Genitive   *dikacha* *stegan*
          Dative   *dikacha* *stegana*
          Ergative   *dikacha* *steguo*
          etc.

This could also be described as syncretism of all oblique cases in the adjective.

   In various 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. Daniel (2000) describes Bagvalal (Nakh-Daghestanian) place names as 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 (or both) of them. A very few nouns distinguish a separate 'counting case' used on nouns quantified by the numerals 2, 3, or 4, while 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.

   Standard schemas exist for names of cases in elaborate case systems; see Mel'čuk (1986); Hjelmslev (1935); Blake (1994); 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 of'); 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 (cf. Latin *nomināre* 'to name'), 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 that marks 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

Table 3.12 *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*

Goal argument of ditransitives (see vol. I, chapter 4), 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.

5   Markedness and obligatoriness

Morphological forms are defined through oppositions: we know that the form *rivers* is marked by a suffix *-s* 'plural' because we know that *rivers*, like hundreds of other such nouns, stands in opposition to *river*, without an *-s* suffix. It is a frequent characteristic of such oppositions that, as in this example, one member is *zero-marked*, i.e. has no overt marker of its own. Another frequent example for zero-marking is the nominative or absolutive case of nouns. More unusual are paradigms with zeros in other places, e.g. the genitive plural of many Russian nouns (table 3.12; zero-marked forms are boldfaced). 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 *gaū* 'village' have zero-marked locatives if (and only if) they function as the goal argument of a verb of directed motion.

(51)   Belhare
     a. Dhankuta-Ø khar-e-ŋa
        Dh.-LOC   go-PAST-[1SG]EXCL
        'I went to Dhankuta'

     b. Dhankuta-e yag-he-ŋa.
        Dh.-LOC   stay-PAST-[1SG]EXCL
        'I stayed in Dhankuta'

In (51a), the place name Dhankuta has a zero locative ending because it serves as the goal argument of the verb. In (51b), 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* (German *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.[18] 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 3.12 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*, *water*, *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 (*-ób*) is reserved for emphasis, contrast, or clarification. Optional number marking of this kind is common in languages all around the Pacific Rim.

When analysing 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

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[18] Such oppositions are called *privative* and are contrasted with *equipollent* oppositions where both members are equally specified. See Baltaxe (1978) and Anderson (1989) for historiographic and theoretical surveys.

the context requires an obligatory opposition, the unmarked form will have the opposite value to 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).

6   Layered (hierarchical) versus templatic 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. In a hierarchical string, 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)):

(52)   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:

(52′)   a′. [[riku-na]-chi]-ku-nku
             '[[see each other]-cause]-themselves'
         b′. [[riku-chi]-na]-ku-nku
             '[[see cause]-each other]-themselves'
         c′. [[riku-na]-ku]-chi-nku
             '[[see each other]-themselves]-cause'

   Some of the clearest examples of layered structure come from multiple case marking (see section 8.2 below, where these examples are discussed further):

(53)   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:

(53′)   [[haacha-wan]-naw]
         '[[axe with] as though]'

A more complex example comes from Kayardild:

(54)   Kayardild (Tangkic, Australia; Dench and Evans (1988:34–5))
         maku-ntha   yalawu-jarra-ntha yakura-naa-ntha
         woman-OBL catch-PAST-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 (of the net); the instrumental is in agreement with 'net', which 'man' modifies; the ablative is in agreement with the verbal tense and indicates prior time reference; and the oblique is in agreement with the case of the entire clause. Thus the word has the following bracketed structure:

(54′)   [[[dangka-karra-] nguni-] naa-] ntha
         [[[man-GEN-] INSTR-] ABL(PRIOR)-] OBL

Dench and 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 (55) and table 3.13. 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

Table 3.13 *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	*°(a)-* ~ *a°-* ~ *aa-*
2pl	*š°(ə)-* *ž°(ə)-*
3pl	*y(ə)-* ~ *r-* ~ *d(ə)-*

thus be said to have word-internal configurationality, with relative positioning in the prefix layers determining function:

(55)   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 3.13 (adapted from Hewitt (1979)). In the following examples, the function of *b(ə)-* 'you (fem. sg.)' is determined by its position:

(56)   Abkhaz (Northwest Caucasian; Hewitt (1979))
         a. bzə̀ya **bə-**z-bò-yt'
            well   2SG.F-1SG-see-FIN
            'I love you' (p. 105)

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

In (56a), *bə-* is in the S/P position of a transitive verb form, so that it is in object (P) function. In the form *bcar* 'if you had gone' in (56b) *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 and Withgott (1986); see also Spencer (1991:208ff.); Inkelas (1993); Stump (1996); Hyman (2003)). 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 of more inward formatives

Table 3.14 *Belhare intransitive verb agreement of selected tense/aspect/mood forms (pf = prefix position, sf = suffix position, Σ = verb stem, N = nasal morphophoneme)*

pf1	pf2	Σ sf1	sf2	sf3	sf4	sf5
mi- '3NSG'	*N-* '3NSG' *N- ~ miN-* 'NEG'	*-yuk* 'DEFINITIVE' *-yakt ~-ɣa(t,t)* 'IPFV'	*-(h)e ~ -att* 'PAST' *-t ~ -yuk* 'NPT' *-a* 'SUBJUNCTIVE'	*-chi* 'DU' *-i* '1/2PL'	*-n(i)* 'NEG'	*-ŋ(a)* 'EXCL' *-k(a(k))* '2'

can be sensitive to more outward formatives, and the position of formatives in the string can be determined by their formal 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 sequencing of inflectional formatives. Table 3.14 illustrates the templatic structure of Belhare (Kiranti) intransitive verbs (see Bickel (1995, 2003), for a complete analysis). 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 *-(h)e* ~ *-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. *n-ta-**at**-chi-**n*** NEG-come-PT-DUAL-NEG 'we two didn't come', with an intervening sf3 filler *-chi* 'DUAL'). The appearance of the negative prefix in pf2 (*N-*) is contingent on the simultaneous presence of the sf4 negation marker (*-n(i)*). (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 3.14, 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 (57a), requires the use of the pf1 filler *mi-* '3NSG'. Although they are semantically compatible, the markers *N-* '3NSG' (as in 57b) and *N-* 'NEG' (as in 57c) cannot co-occur and are therefore assigned the same affix slot (the negative allomorph *miN-* only occurs in infinitives):

(57)   Belhare
    a. mi-n-ta-at-ni
        3NSG-NEG-come-PAST-NEG
        'they didn't come'

    b. n-ta-he
        3NSG-come-PAST
        'they came'

    c. n-ta-at-ni
        NEG-come-PAST-NEG
        's/he didn'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, templatic ordering leads in some languages 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:

(58)   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, Bisang, and Yadava (1999)). It is probably not uncommon for templatic morphology to be determined or at least historically motivated by prosodic and other phonological principles, but research on this area has just begun; see, e.g., Hyman (2003) on the sonority hierarchy as a driving source for suffix ordering in Bantu.

However, templatic versus 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 semantic ordering principles, which interact with whatever other syntactic, morphological, or phonological principles determine formative order in the given language:

(59)   Universal affix ordering in layered morphology
         a. verbs: voice/aspect > modality > status/tense >
                 evidentials/illocutionary force
             (Foley and Van Valin (1984); Van Valin and LaPolla (1997);
             Bybee (1985))
         b. nouns: number > case
             (Greenberg (1963))

These principles are often seen as absolute universals, but there are exceptions, and their status rather seems to be one of *default principles* that apply only in the absence of overriding constraints (chiefly phonological or prosodic constraints).

7   Two examples of common inflectional categories: person and number

Categories that are commonly inflectional and treated in other chapters of this work 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 8). The rest of this section briefly describes two major inflectional categories that are covered only partially or not at all elsewhere in this chapter or this work.

7.1   *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, etc. (see Levinson (1988) for an analysis of such notions). Grammars typically conflate such distinctions and 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.

7.1.1   *Exclusive versus 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. Exclusive here refers to the speaker and his or her group, but excluding the addressee(s). The inclusive forms, by contrast, explicitly include the addressee(s) along with the speaker and his or her group in the notion of 'we'.

Table 3.15 *So pronouns (Kuliak, E. Africa;
Serzisko (1993))*

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

Table 3.16 *Belhare intransitive verb agreement
($\Sigma = $ stem, $N = $ nasal morphophoneme)*

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

    Some languages treat the exclusive versus inclusive distinction on a par
with the basic second versus 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 3.16 is an example from Belhare
intransitive verb agreement (cf. Table 3.14 for the templatic arrangement of
affixes, and table 3.6 for a sample paradigm in the singular). For the exclu-
sive ('speaker(s) but not addressee') this works without complications, since
restricting the reference to one person simply means reference to the speaker.
The inclusive, by contrast, does not allow a true singular value because it com-
prises both the speaker and the addressee and thus requires at least two referents.
While Belhare sidesteps this issue by not having an overt inclusive marker at
all, many languages of Siberia, 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 versus non-singular, these
languages distinguish *minimal* versus *augmented* number (McKay quoted by
Dixon (1980:351–6)). Table 3.17 illustrates this in a Siouan language of North
America. Minimal means singular for exclusive (*ha-* 'I'), second person (*ra-*
'you [sg.]'), and third person, but for the inclusive person minimal entails dual
number reference, i.e. *hĩ-* 'thou and I'. Augmented is plural for all persons (*hĩ-
-wi* 'you and I', *ha- -wi* 'we, excluding you'). In Northern Australian languages,
a third term, *unit augmented*, is sometimes distinguished. This translates as

Table 3.17 *Hocak (a.k.a. Winnebago; Siouan) subject agreement (root* xé ∼ xa *'bury': Lipkind (*1945*))*

	Minimal (-ø)		Augmented (-*wi*)	
EXCL	*ha-xé*	'I bury him'	*ha-xa-wí*	'we (they and I) bury him'
INCL	*hī̆-xé*	'thou and I bury him'	*hī̆-xa-wí*	'we (you and I) bury him'
2	*ra-xé*	'thou buriest him'	*ra-xa-wi*	'you bury him'
3	*xé*	'he buries him'	*xa-wí*	'they bury him'

Table 3.18 *Rembarrnga pronouns (N. Australia: Dixon (*1980*:351–6) after McKay*

	Minimal	Unit augmented (-*pparraʔ*)	Augmented (-ə)
EXCL	*ŋənə*	*yarr-pparraʔ*	*yarr-ə*
INCL	*yəkkə*	*ŋakorr-parraʔ*	*ŋakorr-ə*
2	*kə*	*nakorr-parraʔ*	*nakorr-ə*
3 masc	*nawə*	*parr-pparraʔ*	*parr-ə*
3 fem.	*ŋatə*	*parr-pparraʔ*	*parr-ə*

trial for the inclusive and dual for the other persons, as in Rembarrnga (see table 3.18).

The inclusive minimal form *yəkkə* refers to a simple set of speaker and addressee and thus has a dual referent; the unit-augmented form *ŋakorrparraʔ* adds to this one more referent and therefore has a trial referent (I, you, and one other person); the augmented *ŋakorrə* finally adds further referents, and thus has a plural value (I, you, and several others). For all other persons, the minimal has a singular value (thus, *ŋənə* 'I', *nawə* 'he', etc.), the unit-augmented forms have a dual value (thus, *yarrpparraʔ* 'the two of us, without you', *parrpparraʔ* 'the two of them', etc.), and the augmented forms have a plural value (*yarrə* 'we, without you', *parrə* 'they').

The diagnostic feature of augmented number systems is an additional dual or trial number found only with first person inclusive forms (e.g. Hocak *hī̆-* '1 dual inclusive', but no form glossed '1 dual exclusive'). 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.

7.1.2   Conjunct/disjunct systems

While the distinction between first and second person as indices to the speaker and addressee, respectively, is the most common type worldwide, typological 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 labelled '*conjunct*',[19] 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 what Bickel (2001) calls the *informant*, i.e. the person who the speaker supposes or claims to be the immediate supplier of the information. In statements, this is the speaker himself or herself, but in questions this role of informant is attributed to the addressee. The disjunct person indexes any participant who is not the informant in the speech situation.

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.[20] 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 in conjunct marking:

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[19] The term is from A. Hale's (1980) pioneering description of the phenomenon in Newar. The less than 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). Alternative terms found in the literature are *locutor*, *egophoric*, *subjective*, and *congruent*; cf. Curnow (2002).

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

(60)   Awa Pit (Barbacoan; Ecuador and Columbia; Curnow (2002))

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

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

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

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

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

In (60a) and (60b), the verb is marked for a conjunct person subject: in (60a), a statement, it indexes the speaker; in (60b), a question, it indexes the addressee. The examples in (60c) and (60d) illustrate the conjunct person in undergoer function, again indexing the speaker in a statement (60c) and the addressee in a question (60d). Example (60e) illustrates disjunct marking, which signals that the conjunct person is neither subject nor personally affected by the situation.

7.1.3   *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, and 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 some of them below. We refer to the hierarchy as the *indexability hierarchy* (Bickel (1999)) since its basic variable is the ease with who a referent can be identified – or 'indexed' – from within the speech-act situation. Identification is easiest for speaker and addressee, who are necessarily

co-present, and it is easier for human referents than for other animates because humans tend to be topics in ordinary discourse and are therefore cognitively more accessible. Singular and individualized referents are generally easier to point at unambiguously than groups or masses, so that in many languages they figure higher on the indexability hierarchy. Alternative 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))[21] 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 by adding a *fourth* (or *obviative)* and sometimes even a *fifth* (or *further obviative*) person.[22] Such extensions are best known from Algonquian languages but they are also attested in a few other North American languages. Depending on a number of syntax and discourse factors, NPs in these languages appear in discourse as either third or fourth (or fifth) person. In Cree, fourth person (also called obviative) is marked by the suffix *-a*; third person (also called proximative) is zero-marked. This difference has a reflex on verb agreement. Agreement in Cree and other Algonquian languages is in person–number but it does not indicate role. To indicate the roles, verbs are marked as what is called 'direct' or 'inverse': 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 in the hierarchy. Thus, if a third person acts on a fourth person (downwards, as it were), the verb will be marked as direct. If a fourth person acts on a third person (upwards, as it were), the verb will be marked as inverse. The same logic applies when, for example, a first and a third person are involved. Again, if the action goes 'down' the hierarchy (first acting on third), the marking is direct. If the action goes 'up' the hierarchy (third acting on first), the verb is marked as inverse. The following examples illustrate this.

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[21] 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').

[22] Note that the label 'fourth person' is sometimes used in a different sense. In descriptions of Eskimoan languages, for example, it is the traditional label for reflexives.

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

    a. eː-waːpam-aː-yaːhk-ik   b. eː-waːpam-iko-yaːhk-ik
       DET-see-DIR-1PL.EXCL-3PL (CONJ)   DET-see-INV-1PL.EXCL-3PL (CONJ)
       'We[excl] (1) see them (3)'   'They (3) see us[excl] (1)'

    c. eː-waːpam-aː-t   d. eː-waːpam-iko-t
       DET-see-DIR-3[SG][-4SG] (CONJ)   DET-see-INV-3[SG][-4SG] (CONJ)
       'He (3) sees him (4)'   'He (4) sees him (3)'

In (61a), the direct marker *-aː* signals that a first person acts on a third person. In (61b) this is reversed, and it is the third person that acts on the the first. This is exactly parallel to (61c) and (61d), respectively, but here the relationship is between a third and a fourth (obviative) person (zero-marked here): in (61c) this relationship is direct, so that the third (proximate) person acts on the fourth; in (61d) the relationship is inverse, so that the fourth person acts on the third.

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 I/you and you/me scenarios, and instead there are portmanteau morphemes signalling '1>2' (*-iti*) or '2>1' (*-i*) (where '>' indicates a transitive relationship with the first term as subject and the second as object).[23] 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 (2001)). 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

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[23] Alternatively, one could analyse *-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).

Table 3.19 *Old Church Slavic number paradigm (Huntley ([1993](#):140))*

'woman'	Singular	Dual	Plural
Vocative	*ženo*		
Nominative	*žena*	*ženě*	*ženy*
Accusative	*ženǫ*	*ženě*	*ženy*
Genitive	*ženy*	*ženu*	*ženŭ*
Dative	*ženě*	*ženama*	*ženamŭ*
Instrumental	*ženojǫ*	*ženama*	*ženami*
Locative	*ženě*	*ženu*	*ženaxŭ*

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) ('we can (do it)'), or it can be meant in the generic sense of 'one can (do it)'.

7.2 Number

Number is, minimally, an opposition of *singular* to *plural*.[24] 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 (see table 3.19).

In a number of languages, verbs make an aspectual or aspect-like distinction of single versus multiple action, often in addition to singular versus nonsingular agreement. An example from Chechen is in table 3.20 (semelfactive = single action; pluractional = multiple action).

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

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[24] See Corbett ([2000b](#)) for an exhaustive treatment of number.

Table 3.20 *The Chechen verb 'drive'. 1x = once, Nx = many times*

	Semelfactive	Pluractional
Singular	*loallu* 'one drives one 1x'	*loellu* 'one drives one Nx'
Plural	*loaxku* 'one drives many 1x'	*loexku* 'one drives many Nx'

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 in (42) 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, North America). In a number of languages, verbs make more number distinctions than do 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 (see section 5 above). 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 *number toggling* (or 'inverse number marking') in the Kiowa-Tanoan languages (Wonderly Gibson, and Kirte (1954); Watkins and McKenzie (1984:78ff.); Weigel (1993)), in which nouns have inherent number, every noun being either singular or plural, and the suffix *-go* (and its allomorphs) toggles 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 versus inclusive distinctions on number, which in some cases yields, as we saw in section 7.1.1, 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 (1924b/1969: 192)). Some languages allow this use of nonsingular forms with other nouns as well. Belhare *ama-chi*, 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 (Moravcsik (1994); Corbett and Mithun (1996)): in Hungarian, it is marked by the suffix *-ék* (*Jánosék* 'John and his associates)', 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 goes with 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 Morphology in syntax

8.1 Agreement

Agreement is the phenomenon by which a word carries morphological features that originate somewhere else. For instance, a verb agrees in person with its subject or a modifying adjective agrees in case with the head noun. There are two fundamentally different types, based on where the features originate: head-driven and dependent-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 2. Consider (1) in the introductory section, from German, or the example from Hindi in (62). In this language, agreement targets not only adjectives but also the adnominal postposition *kā* 'of':

(62)   Hindi (Indo-European; South Asia)
         a. lark-õ=k-ā   chot-ā   kamr-ā
            boy-PL.OBL=of-MASC.SG   small-MASC.SG   room(MASC)-SG.NOM
            'the small room of the boys'
         b. lark-õ=k-e   chot-e   kamr-e
            boy-PL.OBL=of-MASC.PL   small-MASC.PL   room(MASC)-PL.NOM
            'the small rooms of the boys'

If the head noun is nominative masculine singular, adjective and postposition end in -*ā* (62a); if the head noun is nominative masculine plural, adjective and postposition end in -*e* (62b).

   Head-driven agreement usually involves gender, number, and/or case and chiefly affects NPs. On the VP and clause level, head-driven agreement is some-times found in the form of transitivity or tense agreement. Transitivity agreement is illustrated by the Australian language Yidiɲ, where it is required across the verbs in a complex predicate VP:

(63)   Yidiɲ (Pama-Nyungan, NE Australia; Dixon (1977:252))
         guwal   dyaraɟ-l gali-ŋal-nyu,   bulmba.
         name[ABS] put-PAST go-APPL:COM-PAST place[ABS]
         '[He] gave names to all the places as he went along' (p. 522)

In this example, the intrinsically intransitive verb *gali-* 'go' receives a comitative applicative marker that increases its valence and thus allows the verb to match the valence of the head verb *dyaraɟ-* 'put'.

   Tense agreement is illustrated by the Uto-Aztecan language Luiseño:

(64)   Luiseño (Uto-Aztecan, S. California; Steele (1990))
         noo=n=il   čaqalaqi-quṣ hengeemal-i
         1SG=1SG=PAST tickle-PAST   boy-ACC
         'I was tickling the boy' (p. 3)

Both the auxiliary (=*nil*) in the Wackernagel clitic position and the lexical verb (*čaqalaqiquṣ*) are marked as past tense, and they must agree in this marking.

   Dependent-driven agreement is the mirror image of head-driven agreement, with features copied from a dependent usually to the head. Classic examples are the registration of possessors on the head noun in an NP (as in the Hungarian and Abkhaz examples, (26) and (29) in section 2 above), or the registration of arguments on a verb. The following Belhare examples illustrate both:

(65)   Belhare
         a. ŋka-ha   a-tak
            1SG-GEN 1SG.POSS-friend
            'my friend'

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

In (65a), the head *tak* 'friend' of the NP registers the person and number of its possessive dependent. In (65b), the verb *ni-* 'see, know' agrees with both the A-argument *unchikŋa* 'they' and the P-argument *ŋka* 'me'. Dependent-driven agreement typically targets the head only. But occasional examples of multiple

targets are attested. Consider the following examples from Archi (agreement formatives are boldfaced):

(66)   Archi (Nakh-Daghestanian, NE Caucasus; Kibrik (1994:349))
         a. buwa-mu   **b**-ez   ditːa**b**u   χːˤalli   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   χːˤalli   a**b**u
            1INCL.ERG:III   bread(III):ABS.SG make:III
            'We made the bread'

In (66a), the absolutive argument *χːˤalli* '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 (*ditːabu* '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 (66a) does not show agreement, unlike the pronoun *nenabu* 'we(incl.)' in (66b). (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 (boldface) are determined by the person of the subject referent:

(67)   Coahuilteco (isolate; N. America; Troike (1981))
         a. Dios tupoː-**n**   naxo-xtʼeːwal wakoː
            God DEM-ACC.1   1PL.S-annoy   CAUS
            'We annoyed God'

         b. Dios tupoː-**m**   xa-kaːwa xo   e?
            God DEM-ACC.2   2s-love   AUX   Q
            'Do you love God?'

         c. Dios tupoː-**t**   a-pa-kʼtaceːy
            God DEM-ACC.3   3s-SUB-pray:PL
            'that (all) pray to God'

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. Nonreferential features like case are rarely affected by dependent-driven agreement (but see Bickel *et al.* (1999) for an example from Maithili). Clause-level categories like mood are equally rare in dependent-driven agreement. However, in some languages, question words sometimes

trigger interrogative mood marking on the verb. This is obligatory in Greenlandic Eskimo (Sadock (1984)) and Hausa (Newman (2000:493)), and is an optional possibility in Japanese (Hinds (1984)):

(68)   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:

(69)   Tauya (Adelbert Range, Papua New Guinea; McDonald (1990))
        we   fofe-ʔe-ne?
        who   come-3SG.FUT-PARAMETRIC.INTERROGATIVE
        'Who will come?'

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.[25] Grammatical person/number agreement marks a relationship between the verb and argument NPs. This is illustrated by the examples in (65b) through (67) above, or, indeed, by the subject agreement found in the English translations of these examples. Pronominal agreement, in contrast, does not mark a relationship between verb and argument NPs; rather, the agreement morphology absorbs argument positions and consequently the agreement-triggering NPs can no longer overtly appear in these positions. Put differently, grammatical agreement points to an argument while pronominal agreement **is** the argument. This is the case, for example, in Irish:

(70)   Irish (McCloskey and K. Hale (1984)) (pronominal agreement)
        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'

---

[25] 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-1980s (see, among others, Jelinek (1984); Mithun (1985); Van Valin (1985); Bresnan and Mchombo (1987)).

In (70a), the verb is inflected for first person singular. This inflection 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 (70b), subject NPs (here, *Eoghan*) can occur overtly. Similar patterns are found all over the world, e.g. in many languages of the Americas (cf. Popjes and Popjes (1986) on a Jê language; Abbot (1991) on a Carib language; and Galloway (1993) on a Salishan language) and in several Semitic languages.

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:

(71)   Chichewa (Bantu, E. Africa; Bresnan and Mchombo (1987:751))
          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'

Example (71a) is unacceptable 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.[26] Moving the NP out of the VP into an afterthought (or fronted topic) position as in (71b) resolves this problem. A similar possibility is given in many Amazonian languages, e.g. in Yagua (Peba-Yagua family; Everett (1989)) or Maxakalí (Jê; Rodrigues (1999)). When NPs are removed from argument positions, their relation to agreement markers is no longer one of feature-matching. Instead, it is one of anaphoric resumption. In this respect, pronominal agreement markers resemble cliticized or incorporated pronouns. However, unlike pronouns, pronominal agreement markers are formatives, not grammatical words. One effect of this is that they have more referential possibilities than pronouns. For instance, they can have indefinite reference ('someone, something') without any special marking. Ordinary pronouns (like *he*, *she*, *it*) usually do not have this option. See Evans (1999) for detailed discussion.

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 in the sentence is a different issue. In most languages, NPs are completely optional in all

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[26] The notion 'primary object' is discussed in vol. I. chapter 4, section 2.3.

positions, regardless of whether the language has grammatical agreement (e.g. Latin, Belhare, or Maithili) or pronominal agreement (e.g. Maxakalí, Yagua, or Chichewa).

Note, however, that there are split systems. Agreement systems can be grammatical in some part (say, subject agreement, or object agreement with animate NPs) and pronominal in other parts (e.g. object agreement, or object agreement with inanimate NPs). Such splits generally reflect ongoing processes of grammaticalization: pronominal agreement involves the same kind of anaphoric links that are found in discourse in general, and, over time, these links can become strengthened and grammaticalized. This results in grammatical agreement systems. See Givón (1976, 1984) for exemplification and discussion.

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. This and similar agreement systems 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:

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

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

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

   c. tsóːn piak tuː niʔ[27] làw   ka-thloʔ   véː
       teacher   ERG   field 1[SG]A[-3SG.P]-work even
       'Even as a teacher I can work the field'   (apposition)

   d. ka-lùŋ   na-n̥ŋ
       1[SG]POSS-heart   2[SG]s-suspicious
       'I suspect you'   (other relation)

---

[27] In keeping with the isolating morphology of this language, words like *tsóːn piak tuː niʔ* 'teacher ERG' 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 (72a) do features merge into unified reference to a single third person. In (72b), the subject argument *aháw* 'who' represents a subset of the referents expressed by the corresponding subject agreement prefix *nàn-* 'you (pl.)'. In (72c), the subject *tsoːn piak tuː niʔ* 'teacher' is understood as a secondary predicate (a copredicate) of the subject (A) prefix *ka-* 'I'. The most complex relation is found in (72d), where the subject NP, of which *'n̥ŋ* '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 (72) above. Integrative systems, by contrast, involve one unitary set of features and the agreement relation merely assures this unity; it does not create it.

8.2   *Case 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* behaviour, where no secondary cases appear. Inert behaviour 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 Utian and Indo-European languages:

(73)   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'

(74)   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 *uchoŭat phendikŋa*, where the instrumental case suffix *-ŋa* appears only once on the head; in fact spreading would be ungrammatical (**uchoŭatna 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 of the instrument 'axe' here. The adjective does not constitute an independent nominative NP. Because of their phrasal scope, inert case markers are sometimes analysed 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* with *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 is rare. An example is preposition repetition in Old Russian (Klenin (1989)):

(75)   Old Russian
        a. **za**   ego djadeju   **za**   Matfěem"
           after his uncle.INSTR after Matthew.INSTR
           'after his uncle Matthew'

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

In (75a), *Matfěem"* is in apposition to *djadeju* 'uncle', and in (75b) *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 several Finnic languages, spreading is limited to only some of the cases and found on only some adjectives. In Chechen, as shown in section 4.6 above, attributive adjectives distinguish only nominative versus oblique cases, which is to say that all oblique cases syncretize in spreading.

It is common for case to be inert on continuous NPs but spreading on discontinuous NPs. 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:

(76)   Warlpiri (Pama-Nyungan, C. Australia; Hale *et al.* (1995:1434))
       a. [NP [N maliki] [A wiri-ngki]] =ji   yarlku-rnu
                 dog   big-ERG   =[PERF-]1SG.P bite-PAST
          'A big dog bit me'

       b. [N maliki-rli] =ji   yarlku-rnu [A wiri-ngki]
                dog-ERG   =[PERF-]1SG.P bite-PAST   big-ERG
          'A big dog bit me'

In (76a) the NP is continuous, so there is no case agreement, but in (76b) case agreement is a mandatory means for identifying the discontinuous parts of the NP.

Stacking of cases within NPs is not uncommon; for surveys, see Plank (1995). Often one of the cases is due to copying and one to assignment, as in Old Georgian:

(77)   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-OBL.PL Israel-GEN-OBL.PL
          'speak to the sons of Israel'

The genitive case in both examples is assigned by the adnominal construction, and the ergative in (77a) and the oblique in (77b) are assigned to 'house' and 'son', respectively, and spread 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 (see the discussion of it above in section 6).

(78)   Huallaga Quechua (Quechuan, Peru; Weber (1989:221)) (= (53) above)
       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'

Table 3.21 *Behaviour 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

(79)   Kayardild (Tangkic, Australia; Dench and Evans (1988:34–5))[28]
(= (54) above)
maku-ntha   yalawu-jarra-ntha yakura-naa-ntha
woman-OBL catch-PAST-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. For example, where two prepositions would be assigned by the syntax in Russian, the first is deleted. This happens in time expressions, as in (80), 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 . . .'.

(80)   Russian
on prishel (*v) bez   chetverti sem'
he came   at   without quarter   7
'he came at a quarter to 7'

Perhaps this is preposition stacking with obligatory syncope.[29]
    Table 3.21 summarizes the behaviour of formatives and words with regard to assignment, spreading, and stacking.

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[28] For glossing of cases and the interlinear (PRIOR) see ex. (54) above.
[29] 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* 'of, from' (lit.: 'from-under'). Both govern the genitive (as *iz* does) and not the instrumental (as *za* and *pod* do).

9   Conclusions

Morphological typology played a pioneering role in the development of typology in the nineteenth century, but in the second half of the last century, the traditional approaches came under heavy criticism for conflating parameters (see the discussion in section 1), and the field was often questioned for its general usefulness (e.g. by Comrie (1981a)). However, advances in the theoretical understanding of the *word* – specifically, the systematic breakdown of this notion into phonological and grammatical words – have now made it possible to put morphological typology on a more precise foundation. In addition, since the 1990s, there has been a renewed interest in the theory of inflection classes and this has improved the understanding of one of the most intricate problems in morphology: allomorphy and the nature of paradigms. Further, the grand renaissance of grammaticalization studies in the early 1990s has brought with it much insight into the diachrony of morphology and its functional and cognitive dimensions.

Together, these three strands of development have led to a rapid and theoretically diverse expansion of the field of morphology. Along with this, morphological typology has begun to survey the languages of the world with new tools and analytical notions. We hope this chapter has shown that morphological typology can in turn improve descriptive analysis by paying close attention to all parameters along which inflectional morphology varies.

10   Suggestions for 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 S. R. Anderson (1992) for a word-based approach. For a basic introduction to morphology, see Haspelmath (2002); for general reference, consult Spencer and Zwicky (1998) or Lehmann, Mugdan, and Booij (2000).

Some of the typological distinctions we draw here are treated under various technical terms in generative frameworks, and are not always easy to recognize: much discussion of synthesis and notions of wordhood (section 1) is currently covered by literature on complex predicates, e.g. Alsina, Bresnan, and Sells (1997) or Ackerman and Webelhuth (1998), and on what is called the principle of lexical integrity (e.g. Mohanan (1995); Bresnan and Mchombo (1995)). On the phonological word, see in particular Hall and Kleinhenz (1999); on grammatical word notions, see Di Sciullo and Williams (1987). The properties of layered morphology as distinct from templatic morphology (section 6) 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 (2001) for some recent controversial discussion. Pronominal agreement markers (section 8) are typically analysed in terms of movement from syntactic argument positions to their morphological host. Grammatical agreement is analysed, by contrast, as base-generation of markers (clitics, affixes) at the host; since such markers co-occur with NPs, the phenomenon is then also referred to as 'clitic doubling' in the literature. See Spencer (1991:384–90) for a useful summary.

4   Gender and noun classes

Greville G. Corbett

0   Introduction

Gender is a fascinating category, central in some languages, absent in others.
The term *gender* is normal in some traditions, in Indo-European and Dravidian
studies for instance, while others use the term *noun class* (sometimes pre-
ferred by Caucasianists and Australianists). A language may have two or more
such classes or genders. In many languages there is no dispute as to the num-
ber of genders, but there are other languages where the question is far from
straightforward; consequently it is important to investigate how we solve such
cases. Furthermore, the classification may correspond to a real-world distinction
of sex, at least in part, but often too it does not ('gender' derives etymologi-
cally from Latin *genus*, via Old French *gendre*, and originally meant 'kind' or
'sort').

While nouns may be classified in various ways, only one type of classifica-
tion counts as a gender system; it is one which is reflected beyond the nouns
themselves through agreement. For example, in Russian we find: *novyj dom*
'new house', *novaja gazeta* 'new newspaper' and *novoe taksi* 'new taxi'. These
examples demonstrate the existence of three genders, because the adjective *nov-*
'new' changes in form according to the noun. There are numerous other nouns
like *dom* 'house', together making up one gender. Since this gender includes
many nouns denoting males, like *otec* 'father', it is known as the 'masculine
gender'. There are many too like *gazeta* 'newspaper' (the feminines, since
nouns denoting females, like *mat´* 'mother', typically belong here) and there
are numerous nouns like *taksi* 'taxi' (the neuters), each requiring the appro-
priate ending on the adjective. There are various other ways in which nouns
could be grouped: those denoting animals, those which are derived from verbs,
those whose stem has three syllables or more, those whose stress changes from
singular to plural. These groupings are not genders in Russian because they
do not determine other forms beyond the noun; they are classifications internal
to the class of nouns. Saying that a language has three genders implies that
there are three classes of nouns which can be distinguished syntactically by the
agreements they take.

Since agreement is taken as the criterion for gender, there are no grounds for drawing a distinction between languages in which the groups of nouns identified in this way correlate with sex and those where they correlate with some other feature, such as human/non-human or animate/inanimate. This is why languages described as having noun classes can normally equally well be said to have genders. Given these different semantic criteria for gender systems, the number of genders is not limited to two, nor to three: four is common and twenty is possible. A further consequence of having agreement as the criterion is that the definition of agreement itself becomes important. Most scholars working on agreement include the control of anaphoric pronouns by their antecedent (*the girl . . . she*) as part of agreement. If this is accepted, then languages in which pronouns present the only evidence for gender should be recognized as having a gender system. This is the most logical approach, but, since it is not universally accepted, such systems are best labelled *pronominal gender systems*.

We shall first consider the problems the linguist / field worker faces when confronted by a gender system, that is, the analytical problem of determining the number of genders and the tests for deciding the gender of a given noun (section 1). We then consider the 'speaker's problem'; the speaker, of course, has to know the gender of a noun in order to use it (and to produce the data which the analyst uses). The way in which the speaker assigns nouns to genders is discussed in section 2; it is a topic which is often of interest to speakers as well as to linguists. Then we consider the question of default gender (section 3), followed by gender resolution, which is a complex area of gender in some languages – those which have the right configuration of the agreement system (section 4). Finally (section 5) we survey the prospects for research into the category of gender.[1]

1   Terms and analysis

Much of the literature on gender is confusing. In many languages the gender pattern appears straightforward. In others, linguists present the pattern as though it were equally uncontroversial, but we find that similar situations are described differently by those working on different language families. Or the number of genders in a particular language can be the subject of considerable dispute.

Evidently we need a consistent approach to analysing gender. The best approach derives genders from *agreement classes*, which are set up solely on syntactic evidence. This syntactic approach provides the first step in a procedure for deciding the number of genders to which nouns can be assigned in a given language. We shall consider the agreement class approach (section 1.1), and then look briefly at other related systems of classification (section 1.2).

1.1   *Analysis based on agreement classes*

We shall follow the widely accepted view that the existence of gender can be demonstrated only by agreement evidence. We cannot demonstrate the existence of a gender system just by looking at the nouns themselves. The presence of markers on the nouns, as prefixes or suffixes, does not of itself indicate that a language has genders (or noun classes); if we accepted this type of evidence, then we could equally claim that English had a gender comprising all nouns ending in *-tion*. In the case of gender, the evidence comes from agreement markers on other sentence elements, whose form is determined by the gender of the head noun of the controller. The range of items which may show agreement in gender is considerable, including adjectives, articles, numerals, possessives, verbs, various pronouns, adverbs (in languages like Lak), adpositions (Abkhaz), and even complementizers (West Flemish); see Corbett (1991:106–15) for examples of all of these. The form of gender agreement varies considerably too.

This approach to gender based on agreement owes a good deal to Zaliznjak (1964). It requires the notion of *agreement class*, which we define as follows:

An agreement class is a set of nouns such that any two members of that set have the property that
    whenever
        (i) they stand in the same morphosyntactic form
    and
        (ii) they occur in the same agreement domain
    and
        (iii) they have the same lexical item as agreement target
    then
        their targets have the same morphological realization.

The intuitive content of the definition is that two nouns are in the same agreement class provided that, given the same conditions, they will take the same agreement form. The three numbered clauses of the definition spell out what is involved in 'the same conditions'. Being in 'the same morphosyntactic form' (clause (i)) means that the nouns have the same specifications for all relevant morphosyntactic features. The features most commonly involved are number and case. We rely on the notions of number and case being given, since they are

simpler notions, which can often be justified simply on morphological evidence. Identity of morphosyntactic form does not imply morphological identity. Two nouns may be in the same morphosyntactic form and yet differ morphologically; for example Russian *mat́* 'mother' and *sestr-u* 'sister' can both be in the same morphosyntactic form, the accusative singular. Yet their morphological realizations are different: they take different endings (they belong to different inflectional classes). Conversely, two morphosyntactic forms may have a single morphological realization; for example Russian *okn-o* 'window' may be the nominative singular or the accusative singular (two morphosyntactic forms for which many other nouns have distinct morphological realizations). Provided that the nouns meet the requirement of clause (i), that is, they stand in the same morphosyntactic form, then they start out, as it were, on level terms.

Clause (ii) requires that the nouns occur in the same agreement domain. This means that the configuration in which agreement applies must be identical in each case: it might be the agreement of modifiers with the head of a noun phrase, subject–verb agreement, and so on. Thus the two nouns must be in the same environment.

Clause (iii) requires that the lexical item which stands as the agreeing element or target must be the same. Since not all lexical items have the same agreement possibilities, it would not do to use, say, in one instance an adjective which distinguished gender and in the other an adjective which did not, nor adjectives which distinguished different numbers of genders. The possibilities for gender agreement can vary according to the syntactic construction, and so for comparison this variable must be held constant. And within the same syntactic construction, lexical items may differ as to whether or not they show agreement in gender or as to the number of gender forms they distinguish. In all instances we are interested in agreement domains and lexical items which allow the largest number of forms; by specifying that identity must be found 'whenever' the conditions listed are met, we ensure that the domain most favourable to gender agreement and the most differentiated agreement target will be included. Clause (iii) ensures that the nouns are tested in an identical way. Then if the same result follows with the two nouns, they must be in the same agreement class.

Let us first consider French, for a straightforward illustration of agreement classes:

(1)   un grand garçon (compare: *une grande garçon)
        a   big   boy

(2)   un grand jardin (compare: *une grande jardin)
        a   big   garden

In these examples we have ensured that the nouns being tested occur in identical conditions: they stand in the same morphosyntactic form (the relevant feature specification is singular), in the same agreement domain (agreement of modifiers within the noun phrase), and the lexical items involved as agreement targets are the same (*un-* 'a' and *grand-* 'big'; either would be sufficient). The nouns *garçon* 'boy' and *jardin* 'garden' require the article and the attributive adjective to stand in the same form ((1) and (2)). If we consider other possible agreement targets, or if we change to the plural, we still find that the agreements required by *garçon* 'boy' and *jardin* 'garden' are identical. They therefore belong to the same agreement class. Now compare these examples:

(3)   une grande femme   (compare: *un grand femme)
       a   big   woman

(4)   une grande fleur   (compare: *un grand fleur)
       a   big   flower

The nouns *femme* 'woman' and *fleur* 'flower' differ from *garçon* 'boy' and *jardin* 'garden' and require the same agreements as each other ((3) and (4)). They belong to the second agreement class. There are many thousands of nouns which behave like *garçon* in the first test frame. Many of them denote male humans and so the gender which they form is conventionally called the 'masculine gender'. However, there are also many nouns, like *jardin* 'garden', which denote inanimates but which take the same agreements as *garçon* 'boy', and so are also members of the masculine gender. Similarly, there are many thousands of nouns like *femme* 'woman', some denoting females and some not (like *fleur* 'flower'), which make up the feminine gender. We thus have two genders. To establish the gender of a given noun, we can try it in the frames in (1) and (3). This will work provided that, for instance, the meaning of the noun allows us to use *grand(e)* 'big' felicitously; for some nouns it will be necessary to change the test to allow for such factors. Similarly, some nouns typically do not occur with the article in French.

While the agreement class approach deals easily with a language like French, another Romance language, namely Romanian, provides a more interesting challenge. Its gender system has given rise to a considerable literature reflecting continuing debate. Consider the following data (from Mallinson (1984:441)) showing adjectives (in the predicate this time, and we assume an appropriate context for each) agreeing with the nouns *bărbat* 'man', *scaun* 'chair', and *fată* 'girl'.

(5)   bărbatul   e   bun
       man.DEF   is good
       'the man is good'

(6)   scaunul   e   bun
       chair.DEF is good
       'the chair is good'

(7)   fata   e   bună
       girl.DEF   is good
       'the girl is good'

(The definite article is postposed; in nouns like *fată* its effect is to change the quality of the final vowel, mainly by lowering, to *fata*.) The evidence so far demonstrates the existence of two agreement classes, one including nouns like *bărbat* and *scaun*, and the other comprising nouns like *fată*. There is a second case (genitive-dative), but in the singular *bărbat* and *scaun* again take identical agreements while *fată* differs. But the situation is more complex, as is revealed when we consider the same examples in the plural:

(8)   bărbatii   sînt buni
       men.DEF   are good
       'the men are good'

(9)   scaunele   sînt bune
       chairs.DEF are good
       'the chairs are good'

(10)   fetele   sînt bune
       girls.DEF are good
       'the girls are good'

If we had only the data of (8)–(10), then we would postulate two agreement classes: one for nouns like *bărbat* and one for nouns like *scaun* and *fată* (the oblique case in the plural shows the same pattern). The argument, a long-running one, is whether we have two genders or three. The reason for the dispute is that nouns like *scaun* have no agreement forms which are used uniquely for them. In terms of agreement classes, however, the situation is clear – we should set up three classes as follows:
  I.   nouns taking the agreement -ø[2] in the singular and -*i* in the plural (*bărbat*)
  II. nouns taking the agreement -*ă* in the singular and -*e* in the plural (*fată*)
  III. nouns taking the agreement -ø in the singular and -*e* in the plural (*scaun*)
Thus we have an unambiguous answer: there are three agreement classes, and there is no reason not to recognize each as a gender. However, just saying that Romanian has three genders might suggest that it is like German, Russian, or Tamil, though these languages have a rather different gender system. All of them

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[2] We use ɸ (zero) for convenience but this does not imply acceptance of zero morphemes.

have some agreement forms which are unique to each gender. The agreement-class approach leads us to the number of sets into which nouns are to be divided (alternatively, the number of values of the feature gender for noun phrases). It is certainly the case that *bărbat*, *scaun*, and *fată* (and the hundreds of other nouns similar to each of them) require three different labels. Nevertheless, the agreeing forms (targets) are simpler in their morphology than is implied by the statement that Romanian has three genders. We should therefore differentiate *controller genders*, the genders into which nouns are divided, from *target genders*, the genders which are marked on adjectives, verbs, and so on. The distinction is illustrated in figure 4.1. This figure shows that Romanian has two target genders in both singular and plural; it has three controller genders, indicated by the lines and labelled I, II, and III. I is usually called 'masculine', II is the 'feminine' and III is the disputed gender sometimes called 'neuter' and sometimes 'ambigeneric'.[3]
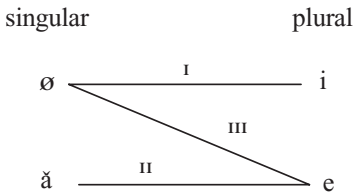
Figure 4.1 The gender system of Romanian

Diagrams like figure 4.1 can be labelled in various ways and we should consider the alternatives. The first target gender is designated 'ø' in the singular on the basis of adjectives like *bun* 'good'. However, not all adjectives take this form: *aspr-u* 'rough' has -*u*, as shown by comparison with *aspr-ă* (feminine) corresponding to *bun-ă*. We have chosen to give typical allomorphs for each target gender. This labelling avoids the danger of premature naming of genders; on the other hand, problems can arise when the typical forms chosen suggest similarities which are not general through the system. (Taking Latin adjectives, we might suppose that the feminine singular -*a* is equivalent to the neuter plural -*a*; however, although many adjectives have identical morphological realizations for these two morphosyntactic forms, not all do.) A way of avoiding the latter problem is to list all the allomorphs, but this can become unwieldy. Since it is hardly practical to keep referring to strings of allomorphs, names such as masculine, feminine, and neuter tend to be preferred. Let us consider French again in this form (figure 4.2). In a language of this type, it is natural to use the same labels for the sets into which nouns are divided (controller genders)

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[3] Carstairs-McCarthy (1994:771) makes the interesting claim that such instances always involve number, never any other category.

singular		plural
masculine	masculine ————————	masculine
feminine	feminine ————————	feminine
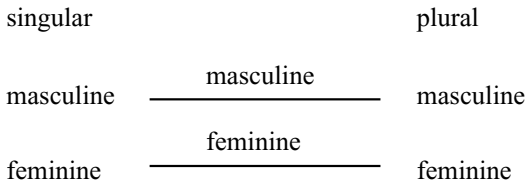
Figure 4.2 The gender system of French

and the sets of agreeing forms (target genders). When this usage is carried over into more complex systems, then difficulties arise. Indeed, although the distinction between controller and target genders may seem an obvious one, there are several examples in the literature of the number of genders being given for a particular language, in cases where the situation is complex, without any indication as to what is meant. While there are many languages where the number of controller and target genders are the same, mismatches of the type we have seen in Romanian are not uncommon.

We have seen that the agreement-class approach gives useful results, for an analysis of controller genders, and that it must be supplemented by the notion of target genders. A further issue which arises is that the number of agreement classes may be considerably larger than the traditional (and often intuitively satisfying) number of genders generally accepted for a given language. While it is important to identify all the classes of nouns which differ in their agreement possibilities, the initial analyses which result can be unsatisfactory for two reasons: first, they miss generalizations; and second, they make similar systems appear more different than they really are. We shall, therefore, look at methods by which the number of agreement classes may be reduced, in principled ways, to give a lower number of genders (for much more detail, see Corbett (1991:161–88)). To give an accurate account of the data of a given gender system, it is important that these steps, and the justification for them, should be made clear, rather than that the genders be presented as self-evident, a mere set of labels for dictionary entries.

First, then, there are *subgenders*. These are agreement classes which control minimally different sets of agreements (agreements differing for at most a small proportion of the morphosyntactic forms of any of the agreement targets). These are well attested in Slavonic languages. If we take the South Slavonic language Slovene as an example, we find three agreement classes whose nouns control very different sets of agreements. But within one of the classes there is a further distinction, found in one form only (agreement with masculine nouns in the accusative singular). According to our definition we have four agreement classes. Looking at the system as a whole it makes more sense to talk of three

genders (required for the statement of most agreement rules, including subject–predicate agreement) and two subgenders, animate and inanimate, which have a much smaller place in the agreement rules. (For recent work on subgenders in the Network Morphology framework, see Brown (1998).)

Inquorate genders[4] are agreement classes which comprise a small number of nouns, whose agreements can be readily specified as an unusual combination of forms available for agreement with nouns in the normal genders. For instance, in the Daghestanian language Lak, there are four genders. But there is one noun which does not fit into the four-gender system, namely *q̄aīa* 'house'. This noun takes gender III agreements in the singular and gender IV in the plural. We should treat it as an individual exception, an inquorate gender rather than a fifth gender. Other languages have a similar situation, with a few such nouns behaving as in one gender in the singular and another in the plural. In all these cases the nouns should be lexically marked as exceptional. The situation is different from that found in Romanian, where the neuter/ambigeneric nouns, which take masculine agreements when singular and feminine when plural, are counted in hundreds and not in ones and twos.

While the cases discussed may appear uncontroversial, it is worth pointing out that if the first published analysis of a language takes a different approach, the existence of a larger number of genders can be perpetuated through the literature. The decision as to whether to treat a particular group of nouns as a full gender, or to mark them as exceptional, (an inquorate gender) is less important than the need for explicitness. It is profoundly misleading to say that a language has eight genders, if four contain many thousands of nouns and four count a handful each. So long as this situation is made clear, the label is secondary.

It is important to note that, for inquorate genders, the nouns can be given an exceptional marker (for an unusual pairing of singular and plural target gender forms) which would allow the normal agreement rules to determine the required markers. Thus Lak *q̄aīa* 'house' is gender III/singular and gender IV/plural. It does not follow that any agreement class with a small number of members is necessarily inquorate, since it may not be possible to give all the nouns an irregular marker in this way. An interesting case is Lelemi (a Togo Remnant language, in turn part of Niger-Kordofanian, spoken in the Volta region of Ghana by 14,900 people at the 1960 census), where there are small numbers of nouns which require unique agreement forms and must be recognized as

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[4] An inquorate meeting is one at which there are insufficient appropriate persons present to take decisions; hence an inquorate gender is an agreement class with insufficient nouns to deserve being labelled a gender. But note, as the text makes clear, that the number of members is not the only criterion; there is also the question of whether the agreements can be characterized as an unusual combination of forms available for agreement with nouns in the normal genders.

Table 4.1 *Agreement patterns in Russian*

attributive adjective	predicate	relative pronoun	personal pronoun	traditional gender
-yj	*-ɸ*	*-yj*	*on-ɸ*	masculine
-aja	*-a*	*-aja*	*on-a*	feminine
-oe	*-o*	*-oe*	*on-o*	neuter

comprising full genders (for these see Heine (1968:114–15, 1982:197–8); and Corbett (1991:173–5)).

The question of differences in targets has already been mentioned. In some languages, all targets mark the same distinctions; we may then take any one target type and use it to establish the agreement classes. In other languages, different targets make a greater or lesser number of distinctions; in such cases, we include the target type which marks most distinctions when establishing agreement classes (for more complex cases, see Corbett (1991:176–7)). Given that different targets may show gender agreement, an important part of the analysis, and one which is normally passed over in silence, is the linking of these forms into *consistent agreement patterns*. Russian can again serve as an example. Earlier, three main target gender forms were noted. For the attributive adjective, we have the nominative singular endings: *-yj*, *-aja*, and *-oe*. The past tense verb, taken here as the representative of the predicate, has three possibilities in the singular: the bare stem, and the endings *-a* and *-o*. The relative pronoun has the same endings as the attributive adjective, and the personal pronouns are *on*, *ona*, and *ono*. For the vast majority of nouns, the agreements are as given in table 4.1, which represents a simplification; the full version would include the other cases, the plural number, and the animate and inanimate subgenders. From the data given, relating to the main genders, the distinctions made by each target gender type are identical. The question is how this analysis is done. It is not as obvious as it appears, since there are nouns which take other combinations of agreements, as we shall see shortly. There are two important factors. The first is that the vast majority of nouns which take agreements with *-yj*, also take *-ø* and *on*; the second point is that these are nouns for which we can give absolute rules: they always take the same agreements. Each horizontal line of table 4.1 represents a consistent agreement pattern, which we define as follows:

A consistent agreement pattern is a set of target gender forms such that:
 (I) the agreement class it induces is as large as possible;
 (II) agreement rules relating to this agreement class will be simple and exceptionless.

A consistent agreement pattern links all the target gender forms of a given gender. The notion of consistent agreement pattern thus gives us a principled way of capturing the intuition that, for example, a feminine marker on an attributive modifier is 'the same as' a feminine marker on a verb, even if they are phonologically different. Thus, it is needed even for languages where different targets mark similar distinctions, as well as for languages where they do not (like Yimas, for which see Foley (1986:86–7, 89, 1991:119–63); Corbett (1991:176–7)).

It is the notion of consistent agreement pattern which allows us to understand and distinguish two types of noun which complicate the analysis of gender systems in interesting ways. First, there are nouns which can take all the agreements of more than one gender. These are often called nouns of *common gender*, particularly where the noun denotes a human and may take masculine or feminine agreements depending on the sex of the human referred to. While nouns which can be masculine or feminine according to the sex of the referent are widely attested, some languages allow nouns to take two genders according to the size and shape of the referent (one such is Manambu, a Ndu language of Papua New Guinea: Aikhenvald (2000:42)).[5] Second, there are nouns which do not simply take the agreements of a single consistent agreement pattern nor belong to two or more genders. Rather, the agreement form used with them depends in part on the type of target involved. Such nouns are termed *hybrid nouns*. One such case is the Russian noun *vrač* in the meaning 'female doctor', which can occur in the following constructions among others:[6]

(11)   nov-yj   vrač
        new-MASC   doctor
        'the new (female) doctor'

(12)   nov-aja   vrač
        new-FEM   doctor
        'the new (female) doctor'

Examples like (11) are more common than (12); recall that we are considering cases where it is a female doctor. In the predicate, the feminine is somewhat more common:

(13)   vrač   rabotal-ø
        doctor   worked-MASC
        'the (female) doctor worked'

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[5] It is possible too for certain nouns to be of different genders according to the sex of the speaker; this is found in Garifuna, a member of the Arawak family spoken in Belize, Honduras, Nicaragua, and Guatemala (Taylor (1977:60); Munro (1998)).
[6] See Dahl (2000) for a different approach to the problem.

(14)   vrač   rabotal-a
        doctor   worked-FEM
        'the (female) doctor worked'

The relative pronoun is usually feminine and the personal pronoun is normally feminine (though even here the masculine is possible): in summary the agreements are like this:

> attributive modifiers   usually masculine, feminine possible
> predicate   both possible
> relative pronoun   normally feminine, masculine rare
> personal pronoun   normally feminine (masculine just possible)

In this remarkable case, the agreement required is variable for all the different types of target. *Vrač* denoting a female is a 'hybrid' noun since it does not take consistently feminine agreements, nor consistently masculine agreements, nor both. The notion of consistent agreement pattern thus allows us to separate nouns like *vrač* from ordinary nouns like, say, *ženšč ina* 'woman' and *mužčina* 'man'; the agreements taken by the latter two each form a consistent agreement pattern while those of *vrač* do not. The distinctive feature of hybrid nouns (like *vrač*) is that the choice of form to be used with them depends in part on the target type. The possible patterns of agreement with such nouns are constrained by the Agreement Hierarchy (Corbett (1991:225–60), 2006: 206–37).[7]

As with inquorate genders, it is important that our descriptions which include details of nouns with double or multiple gender and of hybrid nouns should give an indication of how prevalent these types are. Moreover, the class of hybrid nouns may be, not surprisingly, rather disparate; the different agreements may occur with very different frequencies from noun to noun.

We have seen that, in establishing the number of genders in a particular language, Zaliznjak's approach, based on the notion of agreement class, is a

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[7] The Agreement Hierarchy consists of four target types, which have been introduced earlier in the section. Possible agreement patterns are constrained as follows: 'For any controller that permits alternative agreement forms, as we move rightwards along the Agreement Hierarchy, the likelihood of agreement forms with greater semantic justification will increase monotonically (that is, with no intervening decrease).' The agreements found with Russian *vrač* '(woman) doctor' fit this pattern, since syntactic agreement (masculine) is the more common option in attributive position, with semantic agreement (feminine) becoming steadily more likely as we move along the hierarchy.

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attributive < predicate < relative pronoun < personal pronoun

Figure 4.i The Agreement Hierarchy

useful starting point. It is important to bear in mind, however, that this approach leads us toward controller genders; the other side of the coin is the system of different forms of the agreeing elements: we termed these forms target genders. While in some languages there are numerous agreement classes, not every agreement class is necessarily recognized as a gender. To find how many genders a language has, we begin with agreement classes, separating out all the different sets of nouns according to the different agreements they take. However, we do not automatically accept each set as a gender, as we have seen in this section. This minimalist position in some cases leads us to traditional analyses.

1.2   *Classifiers and complex systems*

Since agreement is a prerequisite for a gender system, classifiers are to be seen as a different phenomenon. Classifiers are of various types, the best known being numeral classifiers. In a language with prototypical numeral classifiers, noun phrases including a numeral and a noun will normally have a third element, the classifier. Thus in the Sino-Tibetan language Burmese, 'one river' might in the appropriate circumstances (where the context involves a river on a map) be translated as *myiʔ tə tan,* literally 'river one line' (the last element is the classifier). Such classifiers are free forms, often appearing also as fully fledged nouns. This is illustrated in the following example (the unmarked case for 'river'): *myiʔ tə myiʔ* 'river one river'; here the noun is repeated as a classifier. In such systems classifiers frequently do not co-occur with certain nouns, and for others classifiers may be obligatory or their use may vary according to speech style. Often, different classifiers are possible with the same noun, and the choice depends on meaning. Thus, apart from the two classifiers already given with the Burmese noun *myiʔ*, there are several other possibilities, such as *myiʔ tə hmwa*, 'river one section', when treating it as a fishing area, and *myiʔ tə ´pa*, 'river one sacred object', when discussing mythology (Becker (1975:113)).

Some languages have classifiers which are not restricted, but occur freely in ordinary noun phrases ('noun classifiers' rather than 'numeral classifiers'). One such is Karo, a member of the Ramarama branch of the Tupi family, with about 150 speakers in the Brazilian Amazon (data from Nilson Gabas, Jr). There are eleven classifiers, mainly classifying according to shape. Again different classifiers may occur with a given noun:

(15a)	iyá	kap	(15b)	iyá	peʔ	(15c)	iyá	ʔaʔ
	stone	CL.together		stone	CL.flat		stone	CL.round
	'gravel'			'digging stick'			'stone'	

The Australian language Yidiɲ also has noun classifiers; furthermore, in Yidiɲ two classifiers may be found together with a single noun (Dixon (1982:192)):

(16)   bama   waguuja   wurgun
         person   man   pubescent.boy
         'teenage boy'

Here the first two elements are both classifiers.[8] These are not part of an agreement system, and so are a different phenomenon from gender. These classifiers do not show variation of a formal property (as is the case when, say, an adjective marks agreement in gender), rather the selection of one classifier as opposed to others is involved. The types of classifiers we have discussed are independent items, selected largely according to semantic criteria, while gender markers typically appear attached to agreement targets. These differences between classifiers and genders (or noun classes) are drawn clearly by Dixon (1982:212–18); see Löbel (2000) for further discussion. There are some similarities too; the selection of classifiers is based on principles which partly resemble the assignment rules investigated in section 2.

Dixon (1982) gives a helpful account of the extremes (which are actually quite commonly found). But things have turned out to be more complex. Various new types of classifier have been identified, since Allan's analysis (1977), including incorporated classifiers (Mithun 1986); revised typologies of classifiers are proposed in Craig (1994) and Aikhenvald (1994:408–14, 2000). Again, it is worth noting that terms are used in confusing ways in the literature: what is a classifier system for one author would be a noun-class system for another.

Between the poles of clear gender systems and clear classifiers, there are classifier-like elements which are affixes rather than free forms; thus in Tuyuca, a Tucanoan language of Colombia and Brazil, classifiers form a single phonological word with the item to which they attach (Barnes (1990:273)). So classifiers are more heterogeneous than was thought, and some are rather similar to gender/noun-class systems. Derbyshire and Payne (1990) give a survey of systems found in Amazonian languages, showing both that there are various intermediate types of classifier and that different systems of classification, including gender systems, can coexist in the same language. A striking case is Tariana, a North Arawak language of Brazil (Aikhenvald (1994)) which has three sub-types of classifier and a gender system. This type of coexistence is not restricted to the Amazon area: Dongo (a member of the Mba group, which belongs to the Ubangian branch of Niger-Kordofanian) has a complex gender system and is in addition developing a system of possessive classifiers (Pasch (1985, 1986:245–55)). There are examples in Australia too; Reid (1997) shows how in Ngan'gityemerri (a southern Daly language with about 150 speakers

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[8] This particular combination of classifiers is unusual in Yidiɲ, consisting of two 'inherent nature' classifiers; more often one is an 'inherent nature' classifier and one is a 'function/use' classifier. See Dixon (1977:480–96) for details.

some 300 kilometres southwest of Darwin) there are both gender-like agree-
ments and classifiers, with evidence that the classifiers are in the process of
developing into gender markers (as suggested in Greenberg (1978)).

Ngan'gityemerri has arguably fifteen genders, with semantic assignment
according to criteria such as male, female, canine, non-human animates (other
than canines), striking instruments, and separate genders for two types of spear.
Nine genders are distinguished by the bound agreement markers found on
agreement targets, such as adjectives (Reid (1997:181)):

(17)   a-syensyerrgimi   a=tyentyenmuy
         ANIMATE-white.rock.wallaby   ANIMATE-tame
         'a tame white rock wallaby' ('=' is used for clitics and '–' for affixes)

Six genders have (optional) freeform generics/classifiers (Reid (1997:177)):

(18)   (syiri)   magulfu   (syiri)   marrgu
         STRIKE   cylindrical.fighting.stick   STRIKE   new
         'a new cylindrical fighting stick'

Syiri is the freeform generic for weapon-like objects which have a striking type
of contact. In its first use in (18) it is analogous to a classifier. In its second use it
is more like an agreement marker. At first sight we might think the language has
two different systems, but this is not the case, since in some genders there is a
generic available in addition to a marker on the noun and to a bound agreement
marker. Moreover, while the use of the generic is optional, so too is agreement
(Reid (1997:168)). Ngan'gityemerri provides a clear window on the rise of
gender systems and of agreement systems. Reid charts the likely development
from freeform generic to bound agreement marker, in a system in which the
generics are still feeding the gender system (pp. 211–22). A similar situation,
with an extensive system, is found in Mitaña, a Witotoan language of Colombia,
analysed in detail by Seifert (2005).

Surprisingly, perhaps, two systems of the gender type can indeed coexist in
a single language. This rare situation is found in the Mba group (Ubangian
branch of Niger-Kordofanian; data from Tucker and Bryan (1966:110, 114–23,
131–40); Pasch (1985:69–71, 1986)). Here we find a system with several dis-
tinctions but none based on sex (which is somewhat similar to the type found
in Bantu languages) and a second system distinguishing up to four members:
male human, female human, animal, and inanimate. The latter system, based on
semantic criteria, is a later development in the Mba group. The four languages
of the group show four different possibilities. Ndunga has only the Bantu-like
system and so is straightforward – the new development has not affected it. At
the other extreme, Ma has lost the earlier system and has only a semantically
based system; this four-gender system is found in pronouns, and elsewhere
there is an animate–inanimate distinction. Ma too is therefore unproblematic.

Dongo, however, has both types of system. For example, verbs agree in animacy (an animate–inanimate distinction) while adjectives preserve a Bantu-like set of agreements. When we look more carefully at adjectival agreement, we find that agreement according to that gender which can be predicted from the morphological class of the noun occurs only with inanimates. Animates, irrespective of their morphology, take the agreements of one specific gender. When we analyse Dongo using the agreement-class approach we arrive at precisely the same genders which could be identified by looking solely at the adjectival agreement forms. Thus, though the gender system of Dongo has two separate origins, the systems have fused and can readily be described using the approach we have developed. (It also has classifiers, as noted above.) The most interesting of the Mba languages in terms of gender is Mba itself. Mba has several inquorate genders, and one or two whose size is not fully clear. To avoid exaggerating the problem, let us concentrate on the well-established genders. If we examine agreement within the noun phrase, we can distinguish six agreement classes. There is also a personal pronoun, used only for animates, which distinguishes male human from other animate in the singular, and has one form for the plural. These pronoun forms can be used optionally as agreement markers, which, it can be argued, gives a three-way distinction: male human versus other animate versus inanimate (for which no optional pronoun is available). Since attributive modifiers show a six-class system and the optional markers divide nouns into three classes, we might expect to find eighteen possibilities (eighteen agreement classes). However, some of the six classes established on the basis of attributive modifiers include only inanimates, so that there are eleven rather than eighteen possibilities. That is to say, the two systems are not fully independent; animacy is a determining factor in both of them. (For a full analysis in terms of agreement classes, see Corbett (1991):184–8).) Thus, there are indeed two systems, but they are not fully independent of each other.

Paumarí is a language which comes closer to having two independent gender systems. It belongs to the Arawá family, and has around 500 speakers living in the state of Amazonas, Brazil. The language has been described by Chapman and Derbyshire (1991), and its gender system specifically by Aikhenvald (unpublished ms.). Paumarí distinguishes masculine from feminine. All nouns denoting females are feminine; so are body parts and the majority of artifacts. Most insects and fish are masculine, and so on. There is a second binary distinction: some nouns (under circumstances we will come to) control a *ka-* form (sometimes *a-*, *ko-* or *ki-*) and others do not. The *ka-* class is the minority. Again, assignment is complex: larger and flatter objects tend to be in the *ka-* class; for instance, *vanami* 'paddle', *kajoviri* 'island'. 'Substances which consist of smaller particles, or are thick in texture' (Aikhenvald (unpublished ms.)) take *ka-*: *jokira* 'salt', *kojahari* 'banana mash'. The *ka-* class does not include any nouns denoting humans.

Table 4.2 *Interaction of genders in Paumarí*

	masculine	feminine
ka-	*kasi'i* 'crocodile'[9]	*ka'da'di* 'head'
non-*ka*	*'arakava* 'rooster'	*arabo* 'land, ground'

The description of the domains in which these agreements operate is complex (Aikhenvald (ms.)); demonstratives and some adjectives agree with the head noun in gender; adjectives also take *ka-* when appropriate, as do stative verb forms used attributively. Certain types of possessive construction involve both types of agreement. In verb agreement, some verbal affixes require gender agreement and verbs also take *ka-* (both according to an ergative pattern, though this is being eroded). Consider this example (Chapman and Derbyshire (1991:255)):

(19) o-ka-nofi-ki   oni   vanami   ka-karaho
      1.SG-KA-want-NON.THEMATIC DEM.FEM paddle.FEM KA-big
      'I want the big paddle'

The noun *vanami* 'paddle' is feminine, and belongs to the *ka-* class. The demonstrative shows agreement in gender, and the adjective has a *ka-* marker. The verb also has a *-ka-* marker, showing agreement with the direct object (the suffix *-ki* is not one of those which marks gender). Thus the domains of gender and *ka-* class agreement are rather different. A further difference is that the masculine and feminine agreement markers are opposed to a plural marker (and so gender is not differentiated in the plural). *Ka-* agreement, on the other hand, does not interact with number; it is retained in the plural.

The independence of the two systems is shown in assignment too: nouns are found showing each of the four logical possibilities (see table 4.2, data from Alexandra Aikhenvald). However, though all four types of noun are attested, the nouns are distributed unequally over the four types, in a way which shows that there are connections between the two criteria. Thus nouns in the *ka-* class are normally feminine (there are few masculines in the *ka-* class).

An equally remarkable case is Michif, the language of the descendants of French Canadian fur traders and Cree speakers in western Canada (Bakker (1997); Bakker and Papen (1997:315–16)). The language has both the masculine–feminine distinction of French, and the animate–inanimate distinction of Cree (which is typical for Algonquian languages, of which Cree

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[9] 'indicates a glottal stop, 'd is a voiced implosive.

is one). Nouns are independently assigned to masculine or feminine and to animate or inanimate; broadly speaking, agreement within the noun phrase is according to the French-type masculine–feminine distinction, while agreement of the verb (and of demonstratives) follows the Cree-type animate–inanimate split.

It remains to be seen what types of different systems can coexist, and how independent they can be (see discussion in Aikhenvald (2000:67–77)). The data from languages like Paumarí and Michif, which have become available in recent years, are fascinating and tantalizing; we must hope for further detailed descriptions of languages with systems of comparable complexity.

2   The speaker's problem: gender assignment

We have considered the analytical problems of determining the number of genders in a particular language. This analysis requires us to establish the syntactic configurations which allow us to separate nouns of different genders and so it provides the test situations for determining the gender of a given noun. Let us now imagine that we have the nouns of a given language all allotted to the appropriate gender (an easy task in some languages, a more difficult one in others). The question is then whether we have a random collection of nouns in each gender or not. From the point of view of the speaker of the language (who must clearly 'know' the gender of a noun in order to produce the examples of agreement that serve as input to our analysis), is it necessary to remember/store the gender of each noun individually? Despite statements in the literature about the apparent arbitrariness of gender in some languages, I claim there is always a system behind the distribution of nouns over the genders. This system, an *assignment system*, is a model of the native speaker's ability to allot nouns to genders on the basis of information which must in any case be stored as part of the lexical entry.[10] This is not to claim that assignment systems are exceptionless; however, even the most complex cases, when carefully analysed, have shown that gender is predictable for at least 85 percent of the nouns, and the figure is normally much higher than that.

Assignment may depend on two types of information: semantic and formal (the latter being a cover term for morphological and phonological information). In one sense all assignment systems are semantic, since genders always have a semantic core (there are no purely formal systems). However, there are systems in which semantic information is sufficient for gender assignment and it is these which we call semantic assignment systems.

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[10] For an extended discussion see Corbett (1991:7–69), and for additional references see Chini (1993:469, 1995).

2.1 Semantic assignment

Let us consider the gender system of Godoberi, a language of the Andic sub-group of the Avaric group of Daghestanian (Northeast Caucasian) languages, with about 2,500 speakers living in the Botlikh area of Daghestan. The data are primarily from Kibrik (1996); a sketch of the language can be found in Gudava (1967). There are three genders, which can be labelled 'masculine', 'feminine', and 'neuter'; as mentioned earlier, because these classes of nouns are so transparent semantically in comparison with Indo-European genders, Caucasianists sometimes prefer the term 'noun class', and they then use numbers (I, II, III) instead of names. Nouns are assigned to the three genders / noun classes as shown in table 4.3. This assignment system is simple and operates consistently. Given the meaning of a noun, its gender can be predicted without reference to its form. Thus, for example, one can be confident that a noun denoting a female will be feminine, and that a noun which is feminine will denote a female. Such systems are sometimes called *natural gender systems*.

Table 4.3 *Gender assignment in Godoberi*

criterion	gender	example	gloss
male rational[11]	masculine (I)	*ima*	father
female rational	feminine (II)	*ila*	mother
other	neuter (III)	*hamaXi*	donkey

2.2 Predominantly semantic assignment

We now move on to languages which have semantic assignment rules which appear to allow sets of exceptions. These exceptions may not be a significant proportion of the nouns in the languages, but they cannot be dismissed as mere sporadic exceptions. A good example is provided by Archi, which has four main genders (data from Kibrik, Kodzasov, Olovjannikova, and Samedov (1977:55–66), and Marina Chumakina, personal communication). The first two genders are straightforward: male rationals make up gender I: *dija* 'father', *dozja* 'grandfather', *allah* 'God'; and female rationals constitute gender II: *dozba* 'grandmother', *baba* 'aunt', *qartaj* 'witch'. There are no non-rationals in these genders. Genders III and IV are more complex, as we see summarized in table 4.4. In this system we find overlapping semantic criteria. Note that for animals, sex is of no importance: the words for 'cow' and 'bull' are both in

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[11] *Rational* is a term frequently found in accounts of gender resolution; it is almost equivalent to 'human', but often includes various mythical beings and often excludes infants.

Table 4.4 *Genders* III *and* IV *in Archi*

gender III	gender IV

domestic animals and birds
    χˤon 'cow'
 	
    dogi 'donkey', *qaz* 'goose'
	young animals and birds (wild and domestic)
	biš 'calf', *k'eˤrt* 'foal (of donkey)'

larger wild animals and birds
    pil 'elephant', *jam* 'wolf',
    liq'ʔ 'eagle', *isu* 'owl'
	smaller wild animals and birds
	    ojomči 'hare', *mejmanak* 'monkey',
	    hud-hud 'hoopoe', *žibela* 'swallow'

all insects *hilku* 'fly', *nibsu* 'moth'	
mythical beings *žin* 'genie', *ilbis* 'devil'	

musical instruments
    parχ 'drum', *moχol* 'tambourine'
	most tools and cutting instruments
	    bel 'spade', *dab* 'awl', *k'os* 'knife'

cereals
    qoqol 'wheat', *maχa* 'barley'
	cloth, most clothing
	    at'ras 'satin', *palatnoj* 'linen', *k'az*
	    'shawl', *χalac'i* 'sleeve'

trees
    had 'lime', *kal* 'fir'
	metals
	    lacut 'iron', *qalaj* 'tin'

water phenomena
    ɬat 'sea', *baˤIri* 'lake',
    biɬw 'whirlpool', *qol* 'ice'
	liquids
	    ɬn 'water', *čixir* 'wine'
	    nabq 'tears', *χːˤel* 'rain'

astronomical and meteorological phenomena
bac 'moon', *barq* 'sun',
    marχəla 'snow',
    χːumuš 'snowstorm'
	abstracts (including some temporal concepts)
	qˤit: aqˤ 'summer', *sot:aqˤ* 'autumn',
	    iq 'day', *s:an* 'year', *mukul* 'beauty',
	    eˤmt'i 'cry'

gender III. There is a division between domestic animals and birds (all III except their young) and wild animals and birds. The latter divide into larger (III) and smaller (IV), though *noq'ˤon* 'mouse' is unexpectedly in gender III. The young of animals and birds are in gender IV. There is thus a correlation between large (III) and small (IV), which is confirmed by examples of nouns denoting concrete objects (many of which are otherwise problematic). We find pairs like *šahru* (III) 'town', *χˤor* (IV) 'village', and *χˤit* (III) 'scoop' and *χˤit* (IV) 'spoon'.

A second correlation is that concrete objects tend to be in gender III and abstracts in gender IV, as seen from the last categories in table 4.4. There are further possible connections: there are similarities between cloth and liquids (both IV), both being non-count and non-rigid (though the same could be said of cereals, which belong to gender III). And the items listed under 'water phenomena' (III) are typically larger, more specific instances of liquids than the general terms in IV. We may say that prototypical members (that is, best or most central instances) of gender III are concrete and large (*pil* 'elephant', *kal* 'fir',

bac 'moon'). The typical member of IV is not. In other instances the motivation for assignment to gender III or IV is not straightforward; this is particularly true for nouns denoting inanimates not covered by the criteria given.

In systems of the predominantly semantic type, assignment is based on semantics, but not in the absolutely straightforward way which we observed in Godoberi. Languages of this type may be hard to analyse when approached with conventional semantic features in mind; an understanding of the world view of the speakers may make the gender system more comprehensible. A well-known case of this type is Dyirbal, for which see Dixon (1982).

2.3   *Morphological assignment*

We have looked at Godoberi, in which semantic criteria are sufficient for assignment, and Archi, which allows various numbers of exceptions (and many more instances of each language type could be given). We now come to languages in which large numbers of nouns fall outside the semantic assignment rules. These nouns may be handled instead by formal assignment rules, rules which depend on the form of the nouns involved rather than on their meaning. These latter rules are of two types, morphological and phonological, which we will consider in turn (sections 2.3 and 2.4). Whereas the distinction between semantic and formal assignment rules is clear (though their effects may overlap), the distinction between morphological and phonological rules is not always clearcut. As a starting-point, we may say that phonological rules refer to a single form (typically the most basic form) of a noun, for example, 'nouns ending in a vowel are feminine'. Morphological rules, on the other hand, require more information; they need to refer to more than one form, though this is not always obvious. A typical assignment rule of the morphological type might be: 'nouns of declension II are feminine'; establishing that a noun is of declension II might require information about, say, the nominative singular and the genitive singular. (While declensional classes are abstract notions, for our purposes the important point is that they relate to forms – inflections – rather than to semantics.)

A clear example of a morphological assignment system is Russian, an East Slavonic language with three genders. The masculine and feminine genders have a semantic core, as can be seen from the semantic assignment rules.

Semantic assignment rules

(I) Sex-differentiable nouns denoting males (humans and higher animals) are masculine: *otec* 'father', *syn* 'son', *djadja* 'uncle', *lev* 'lion'.

(II) Sex-differentiable nouns denoting females are feminine: *mat́* 'mother', *doč́* 'daughter', *tetja* 'aunt', *ĺvica* 'lioness'. (Note that ´ transliterates the Russian soft sign, which normally indicates palatalization of the preceding consonant.)

Sex-differentiable nouns are those where the sex matters to humans (as in the case of humans and domesticated animals) and where the difference is obvious (as with lions).

While these rules operate with very few exceptions, they do not cover a large proportion of the nouns, those which make up what we call the 'semantic residue'. It is not the case that all the nouns in the semantic residue are neuter. Rather they are distributed over the three genders. This situation, a common one in Indo-European languages, is shown schematically in table 4.5.

Table 4.5 *Gender assignment in Russian (semantic criteria only)*

gender	criterion
masculine	male + residue
feminine	female + residue
neuter	residue

To confirm that the nouns of the semantic residue are indeed found in all three genders, consider those in table 4.6.

Table 4.6 *Examples from the semantic residue in Russian*

masculine	feminine	neuter
žurnal 'magazine'	*gazeta* 'newspaper'	*pisʹmo* 'letter'
dom 'house'	*izba* 'hut'	*zdanie* 'building'
čaj 'tea'	*voda* 'water'	*vino* 'wine'
avtomobilʹ 'car'	*mašina* 'car'	*taksi* 'taxi'
denʹ 'day'	*nočʹ* 'night'	*utro* 'morning'
nerv 'nerve'	*kostʹ* 'bone'	*serdce* 'heart'
glaz 'eye'	*ruka* 'hand'	*uxo* 'ear'
lokotʹ 'elbow'	*lodyžka* 'ankle'	*koleno* 'knee'
flag 'flag'	*èmblema* 'emblem'	*znamja* 'banner'
zakon 'law'	*glasnostʹ* 'openness'	*doverie* 'trust'

It does not seem possible to account for the gender of these nouns by reference to their meaning. Nevertheless, gender in Russian is highly predictable; for many nouns it is determined not by semantic but by formal factors, namely by the declensional class of the noun, as we shall see. From some of the examples given already, it might appear that simple phonological rules would be sufficient: for example, concerning the final segment of a noun. Unfortunately, there are numerous examples for which no such rule works, pairs such as *portfelʹ* (masculine) 'briefcase' and *pylʹ* (feminine) 'dust'. The forms discussed so far are those of the nominative singular. Attempts using any other case form, which

would in any case be harder to justify since the nominative is the basic case, are less successful than those using the nominative, so we shall not pursue them. It could be argued, however, that, since Russian has at least six cases, a phonological rule should be based not upon a particular case form but upon the stem; this more consistent approach actually fares rather worse, since the two nouns above have stems identical to the nominative singular, while other nouns such as *nedelja* 'week' (feminine) also have palatalized stems (/nedelʹ/) which cannot be distinguished from the two above.

Table 4.7 *Noun paradigms in Russian*

		I	II	III	IV
	NOMINATIVE	zakon	gazeta	kostʹ	vino
	ACCUSATIVE	zakon	gazetu	kostʹ	vino
SG	GENITIVE	zakona	gazety	kosti	vina
	DATIVE	zakonu	gazete	kosti	vinu
	INSTRUMENTAL	zakonom	gazetoj	kostʹ ju	vinom
	LOCATIVE	zakone	gazete	kosti	vine
	NOMINATIVE	zakony	gazety	kosti	vina
	ACCUSATIVE	zakony	gazety	kosti	vina
PL	GENITIVE	zakonov	gazet	kostej	vin
	DATIVE	zakonam	gazetam	kostjam	vinam
	INSTRUMENTAL	zakonami	gazetami	kostjami	vinami
	LOCATIVE	zakonax	gazetax	kostjax	vinax
		'law'	'newspaper'	'bone'	'wine'

Note. Forms are given in a transliteration of the standard orthography, which is largely phonemic. Palatalization of the preceding consonant is indicated by both ´ and *j*.

The assignment rules require access to more than one case form of the noun, in other words, to its declensional class; they are therefore morphological assignment rules. Russian has four main noun paradigms, which account for all but about twenty of the declinable nouns (this analysis is justified in detail in Corbett (1982:202–11)). Examples are given in table 4.7. Given these declensional classes, it is relatively simple to predict the gender of a noun.

Morphological assignment rules

(I) Nouns of declensional class I are masculine.

(II) Nouns of declensional classes II and III are feminine (but see below).

(III) Others are neuter.

These morphological rules are highly predictive; we might therefore ask whether the semantic rules given earlier are superfluous. The nouns which were assigned to gender because of their semantics might instead come under the morphological rules. For instance, *otec* 'father' would be assigned to the

masculine gender because it is in declension I, and *mať* 'mother' to the feminine because it is a member (an irregular one) of declension III. But this approach would not account for nouns like *djadja* 'uncle' and *deduška* 'grandfather'. They denote males and so should be masculine by the semantic assignment rules; at the same time, they belong to declension II, and so would be expected to be feminine. In fact they are masculine (just as in Latin, nouns like *agricola* 'farmer' are masculine). Thus there can be different predictions from the two sets of rules, and when this occurs the semantic rules take precedence.

There are further complexities, involving acronyms, indeclinables, and the animate subgender (for which see Corbett (1982)). The essential point is that many nouns are assigned to gender by the semantic assignment rules. For the semantic residue, the nouns for which there is no semantic assignment rule, the gender can be predicted by the morphological assignment rules. A more formal analysis, demonstrating that the proposed assignment rules do in fact make the correct predictions, is given in the Network Morphology account in Fraser and Corbett (1995).[12] Such assignment systems are common in Indo-European languages; they are also found widely elsewhere, for instance in Bantu languages.[13]

2.4   *Phonological assignment*

We now turn to examples of phonological systems of gender assignment, those in which gender can be established by reference to a single form. These vary in complexity. A simple case is the two-gender system of Qafar (Afar). This East Cushitic language (Cushitic forming part of Afro-Asiatic) has approximately 250,000 speakers in northeastern Ethiopia and in Djibouti (data are from Parker

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[12] Our Network Morphology account is expressed in DATR, a lexical knowledge representation language devised by Roger Evans and Gerald Gazdar (see Gazdar (1990); Evans and Gazdar (1996)). This fully explicit language has a compiler, so that it is possible to check that an inheritance network expressed in DATR captures the intended generalizations. This means that we are able to demonstrate that our analysis does indeed assign Russian nouns to the appropriate genders. The importance of this is that, while the semantic and phonological assignment systems discussed are relatively clearcut, the morphological systems have sometimes been analysed differently (when the number of declensional classes and the number of genders is similar, this leads some to try to predict declensional class on the basis of gender). There is a set of arguments in Corbett (1982) showing the difficulty with such an approach. Being able to express our analysis in DATR takes the debate a step forward in that we can prove that the approach assigning gender on the basis of declensional class does give the right results. No such analysis is at present available for the alternative, which would not, of course, fit in with the typology proposed. This is an instance of the usefulness of computational techniques for typologists.

[13] The complex interactions of gender and morphological form in Mayali, a non-Pama-Nyungan language of northern Australia, are analysed in Evans (1997) and Evans, Brown, and Corbett (2002). Again the analysis is implemented to demonstrate that the nouns are indeed assigned to the appropriate gender.

and Hayward (1985: esp. p. 225)). Nouns denoting male humans and the males of sexually differentiable animals are masculine; for example: *bàqla* 'husband'. Females (human and animal) are feminine: *barrà* 'woman, wife'. Note that ' indicates the accent position, which marks potential high tone. These semantic assignment rules are unremarkable. The phonological rules are of greater interest:

Phonological assignment rules

(I) Nouns whose citation form ends in an accented vowel are feminine: *catò* 'help', *karmà* 'autumn'.
(II) Others are masculine. There are two possibilities:
    (a) those ending in a consonant: *cedèr* 'supper time', *gilàl* 'winter';
    (b) those with a citation form ending in a vowel but with non-final accent: *tàmu* 'taste', *baànta* 'trumpet'.

These phonological rules have few exceptions; an example is *doònik* 'sail-boat', which 'ought' to be masculine but is feminine.

When the two sets of rules are in conflict, the semantic rules take precedence (as in Russian). Thus *abbà* 'father' is masculine because of its meaning, even though it ends in an accented vowel, normally an indicator of feminine gender. Conversely, *gabbixeèra* 'slender-waisted female' is feminine, though the accent is non-final, which is a masculine pattern. Such phonological assignment systems are also found all over the world, as in the Kru language Godie and, in a much more complex form, in French.[14]

Before leaving assignment systems there are several general points to note. We have considered clear examples of the different types of assignment system. Sometimes we find complex overlapping of features: in these cases the gender of nouns is still largely predictable, but the rules and their interactions are more difficult to establish.[15] A language like this is German, for which see Zubin and Köpcke (1986), and references there. Another complex and interesting case is Lavukaleve, a Papuan language spoken on the Solomon Islands (Terrill (2003)). A different type of complexity its that there are languages which at first sight appear to have phonological assignment systems, since gender can often be predicted from a single form, but which on closer examination turn out to have morphological systems. In these, the simplest analysis results when we see that phonology determines declensional class, and declensional class in turn determines gender. A good example of this type of system is found in the Papuan language Arapesh, for which see Aronoff (1992b, 1994:89–121) and Fraser and Corbett (1997), all following the description in Fortune (1942). It

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[14] For which see Corbett (1991:57–61), and for work stressing the importance of the final syllable see Hardison (1992).
[15] Interesting complications in Australian languages with body parts, which may have intrinsic gender or take the gender of the whole (or the strategies may be mixed), are described in Evans (1994).

should be borne in mind that the assignment systems we have called formal systems still have a place for semantic rules; these provide the semantic core for (some of) the genders but have to be supplemented by formal type rules. There are no purely formal gender assignment systems: there is no language in which, say, all nouns beginning in a vowel are assigned to one gender, all those in a consonant belong in the other, with there being no correlation of the two genders to some semantic feature. Finally, though some still claim that gender is arbitrary, more and more of the difficult languages in this regard are being successfully analysed: French on three occasions, independently (Bidot (1925); Mel'čuk (1958); Tucker, Lambert, and Rigault (1977)); German is becoming clearer, notably in the work of Zubin and Köpcke mentioned above; and more recently Swedish has proved to be substantially predictable (Källström (1996); Fraurud (2000)).

3   Default genders

The notion of 'default' is current in linguistics, in large measure through the influence of Generalized Phrase Structure Grammar (Gazdar, Klein, Pullum, and Sag (1985)). References specifically to 'default gender' can also be found in increasing numbers (for instance, in Hayward (1989)). But this term has been used in various different ways, sometimes by a single author, so there is a danger that a potentially valuable notion could become debased. There are distinct uses, which we shall examine briefly (for more detail see Fraser and Corbett (1997), and especially Corbett and Fraser (2000)). In particular, it is important to avoid the trap of assuming that a given language will have one default gender: different types of default sometimes coincide and sometimes do not. Naturally the notion of default is connected to markedness (Gazdar *et al*. (1985:29–31); Zwicky (1986:306–7)). However, gender has proved problematic for traditional accounts of markedness. An early paper on the topic is that of Schane (1970), who discusses French and shows how the masculine may be considered unmarked according to different criteria. But since French has only two genders, this is not remarkable, and the patterns suggested tend to break down when more complex systems are considered. Greenberg too (1966:38–40) considers the question of the markedness of gender 'less clear' than with other categories.[16] Both unmarked and default cases are in some sense 'normal' (though we shall need to revise this view for some instances of defaults discussed below); markedness theorists typically look for language-independent criteria to establish unmarked values, while defaults are worked out on a language-internal basis.

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[16] For further discussions of markedness, see Schwartz (1980), Moravcsik and Wirth (1986), and Greenberg (1988).

3.1 Types of default

An obvious area in which to begin a discussion of default genders is that of gender assignment. The assignment rules given earlier can be thought of as defaults; thus, by default, Russian nouns denoting males are masculine; also by default, nouns of declensional class II are feminine. Note already that we must allow for defaults to interact, since a noun can denote a male and be a member of declensional class II (like *djadja* 'uncle', in which case it is masculine). If we hanker after identifying one gender as *the* default, in the case of Russian we would have to say that it is the masculine, for various reasons (for instance, class I is the default declensional class, and masculine is the gender associated by default with this class; masculine has the largest number of nouns, it attracts the most borrowings). This may convince some, provided we remain with the problem of gender assignment. Now consider this example:

(20) Na večerinke byl-o   interesn-o
      at party   was-NEUT.SG interesting-NEUT.SG
      'it was interesting at the party'

Here there is no overt subject, but the verb and adjective must still take a particular agreement form and they take not the masculine but the neuter. The masculine may then be the default gender for *nouns*, but it is not the default gender throughout the grammar of Russian. A higher-level default for gender is needed for items, other than nominals, which may head syntactic constituents with which gender agreement is required. The situation arises if, as in (20), there is no overt subject, or if an infinitive phrase stands in subject position, or if agreement is with an interjection or other quoted material. Intuitively the two cases of default we have considered are somewhat different (see Fraser and Corbett (1997)): in the first type, the default accounts for the cases when 'everything goes right' (as with nouns denoting males being masculine). We shall call instances of this type *normal case defaults*. In the second use of the term, a default is something which applies when the normal system breaks down, when 'something goes wrong' (as in the verb having to show agreement with a non-prototypical noun phrase). We shall call instances of this type *exceptional case defaults*.

Consider now the forms used. In the case of the verb it is straightforwardly a neuter singular form. But the adjective is more complex. Russian adjectives have two forms available for predicate use, the long form and the short form. The short form is being lost in most uses; however, in examples like (20), the short form is required. Thus it is not sufficient to say that these forms are neuters. For these and other reasons we need to distinguish *neutral* agreement forms, as required for agreement with non-prototypical controllers, from other agreement forms. In Russian, by default, these neutral forms are the same as the neuter.

A clear case of the neutral form having special properties is found in Romanian, where it varies according to the particular agreement target (data from Donka Farkas, see Corbett (1991:213–14)).

(21) e evident   că a venit, şi asta   o
      is clear.MASC.SG that has come and this.FEM.SG it.FEM.SG
        ştie   toată lumea
        knows all   the.world
      'It is clear that s/he came and everyone knows this'

Here we have a clause as subject (some might prefer to say there is no subject); the predicative adjective has to mark agreement, and is masculine (*evidentă,* the feminine form, is unacceptable). *Asta* 'this' can stand for 'that s/he came' or 'it is clear that s/he came'. Either way it must be feminine (the masculine *ăsta* is unacceptable). Thus the form used for neutral agreement in Romanian varies according to the type of target involved. The next example includes attributive modifiers:

(22) Un   bum   puternic   a fost auzit
      a.MASC.SG. 'boom' strong.MASG. SG has been heard.MASC.SG
      'a loud boom was heard'

Here *un* 'a' is masculine, like the agreeing predicate. Consider now the demonstrative:

(23) asta   e uluitor
      this.FEM is amazing.MASC
      'this is amazing'

Here *asta* refers to a situation not a specific object. While it is morphologically feminine, its takes a masculine predicate. Thus *asta* is a special neutral form, since it controls a different agreement from the *asta* which can stand for a noun of feminine gender.

3.2 Defaults in gender systems

Given that the notion of default appears valuable, we now sketch informally the areas of gender where this notion might be applied.

We have already considered assignment systems, and perhaps the most straightforward examples of defaults are found in gender assignment systems of the semantic type. A clear instance is found in Diyari, an Australian Aboriginal language which had about a dozen speakers at the last report, living near Lake Eyre in the north of the state of South Australia. One gender is for 'all animates whose reference is distinctly female, for example, women, girls, bitches,

doe kangaroos etc.'; the other is for 'all others, that is, male animates, non-female animates, non-sexed animates and all inanimates' (Austin (1981:60)). By default in Diyari nouns are masculine. The converse system, in which nouns denoting males are singled out as masculine and all others are feminine, occurs in Kala Lagaw Ya, the language of the western Torres Straits Islands (Bani (1987)). Here by default nouns are feminine. (Note, however, that the moon is also masculine, as is generally the case in the languages of Australia.) These are obvious cases of normal case defaults.

If we move on to gender agreement, we find three broad types of problem, all caused by agreement controllers other than straightforward noun phrases. The problems arise because, if a particular target type can mark agreement in gender, then in many languages it must, whether or not there is a normal noun phrase to act as controller.

The first type of problem is that there are constructions in which the target has to agree in gender with a controller which is not specified for gender. The obvious examples here are those of the type we have already discussed, namely the 'neutral' agreement which results from agreement with non-prototypical controllers. The range of non–prototypical controllers varies from language to language. It may include clauses, infinitive phrases, nominalizations, interjections and other quoted phrases, noun phrases in particular cases (for example, subject noun phrases in an oblique case), dummy elements, and certain null elements.

Languages may solve the problem of agreement with non-prototypical controllers by pressing one of the regular gender/number forms into service. The form may be termed the 'neutral agreement form' as above or the 'default agreement form'. Though neutral agreement forms may appear to be identical to some other form, they are usually odd in some ways. Thus they typically appear identical to singular markers but they lack plural counterparts. Moreover certain target types may be avoided. And as we saw in Romanian, the form to be used can vary according to the target type. Some languages have unique neutral agreement forms (examples are Spanish, Portuguese, the Surselvan dialect of Romansh, Ukrainian, and the Sele Fara dialect of Slovene). However, no language has yet been found with a full set of unique neutral forms: regular gender/number forms are used for some targets.

An interesting development occurs when neutral forms are used when the controller is an apparently straightforward noun phrase. This phenomenon is well attested in Scandinavian languages (Faarlund (1977); Hellan (1977:102–8); Eriksson (1979); Nilsson (1979); for extensive discussion see Källström (1993:188–246) and Hedlund (1992:95–111)). Our example is Norwegian, taken from Faarlund (1977).

(24)

Ein ny   utanriksminister ville   ikkje vere så dumt
a   new foreign.secretary would not   be   so stupid.NEUT.SG
'a new foreign secretary would not be a bad idea'

Norwegian predicative adjectives in the singular distinguish two genders, neuter and common. In (24) the neuter form is used, and the interpretation is that having a new foreign secretary would not be a bad idea. If the adjective were in the common form *dum*, then it would agree directly with the subject noun phrase and the interpretation would be less complimentary.

Even if the agreement controller is a noun phase headed by a noun or pronoun, there may still be problems involving gender agreement, caused by reference difficulties. These are the second type of gender agreement problems to consider. These have mainly been investigated relative to human referents, though there can be similar problems (usually in larger gender systems) with non-humans. There are at least three sub-areas to investigate (it is not even clear whether all the different types have yet been identified): the gender required may be unknown, unclear, or mixed.

Suppose we ask *Who said that?* in a language which requires agreement in gender on the verb. We cannot determine the gender, since we cannot identify the referent of *who*; thus the gender required is unknown. Similarly, when we ask *What was that?* we may have theoretically possible referents of more than one gender. As a variant of this type we may have a noun, like English *manager* or *friend*, which can be used of a person of either sex. Again, in a specific, instance, we may not know the sex of the referent. Second, there are cases where the gender required is unclear because the referent is non-specific:

(25)   If a patient wishes to change doctors, he / she / he or she should
         advise the receptionist.

A third area of difficulty here is agreement with a noun denoting a group of referents which would separately be referred to with nouns of different genders. The most obvious examples involve humans of both sexes (*villagers*, *athletes*). Here again the sex cannot be uniquely determined, but if the language distinguishes gender in the plural, then clearly one form must be selected for agreement purposes.

We shall see that there are two main approaches to dealing with these problems. First, one of the possible alternative agreement forms may be used by convention – an obvious type of default. If the 'reasonable possibilities' are genders A and B, then either A or B is chosen. The second possibility is for an 'evasive' form to be used. If the 'reasonable possibilities' are genders A and B, then gender C is chosen.

It is often assumed that in a single language, all problem types are dealt with in the same way (for example, it may be stated or implied that a particular

gender is the unmarked or default one and so used in all these cases). But in fact languages may handle the three parts of the problem (gender unknown, unclear, or mixed) differently. This is an area where there has been a good deal of research on one small part of the topic but where much of the problem is only poorly understood.

Consider first the case where the appropriate gender is unknown. Suppose we have a language in which there is at least a masculine gender (containing nouns denoting males, and other nouns) and a feminine gender (for females and other nouns). For the problem cases above, one set of target gender forms, say the masculine set, could be used by convention. This situation is found in many Indo-European languages. Let us take a Russian example:

(26)   Kto   èto   sdelal?
        who   this did.MASC
        'who did this?'

The speaker does not know the sex of the person responsible, but the masculine is used. Surprisingly, even in a setting in which the person must be one of a group of women, masculine agreement is still normal. Though the literature might suggest otherwise, it is not the case that the masculine is always used. In the Nilotic language Maasai, we find the feminine used for questions when the person involved could be male or female (Tucker and Mpaayei (1955:27); for more on this interesting gender system, including the role of derivational morphology, see D. L. Payne (1998)). If we now consider nouns which can be used in reference to a male or a female, then we find that in Russian, nouns like *vrač* 'doctor', take masculine agreements if the sex is not known. In Archi, however, we find an 'evasive' form. As we saw in section 2.2, Archi has four genders, I and II for humans, male and female, III and IV less clearly defined semantically but with the larger animates in III and most abstracts in IV. In Archi, nouns like *lo* 'child', *adam* 'person', *c'ohor* 'thief', *misgin* 'poor person' take gender IV agreements in the singular if the sex of the referent is unimportant or unknown (Kibrik (1972:126)). This shows a particularly clear example of an evasive form, since gender IV does not contain any nouns denoting humans.

The second type of reference problem, non-specific referents, has created a considerable literature, but generally with reference to a small number of languages. English can use the masculine here (*Everyone loves his mother*) or the plural can be used to evade the gender choice (*Everyone loves their mother*).

The third reference problem involves mixed groups. Usually mixed groups of humans are investigated, but in large gender systems there could be analogous problems with inanimates. Given, however, a mixed group of humans, in Serbo-Croat (South Slavonic) we find the masculine plural *oni* 'they' in such cases. We

may take the problem back into derivational morphology: *Amerikanac* (masculine) is a male American, while *Amerikanka* (feminine) is a female American in Serbo-Croat. To refer to Americans in general, the plural of the masculine noun is used, that is, *Amerikanci*, and it takes masculine plural agreements. This instance of the way in which gender is assigned to nouns denoting mixed groups links directly to the analysis of agreements used with conjoined noun phrases, which we consider in the next section. The 'opposite' system is found in the Khoisan language Dama, spoken in northern Namibia; here mixed groups of people are referred to using the feminine pronouns (John Payne (p.c.)). In this problem area too, 'evasive' forms are an alternative strategy. Polish for instance uses the neuter singular. This usage is described by Gotteri (1984), who took up the term *evasive* following a suggestion by Doroszewski. An example of the Polish neuter in evasive use is the following:

(27)   Któr-eś   z   małżonków jest winn-e   zarzucanej mu
        one-NEUT from spouses   is   guilty-NEUT imputed   it.DAT
          zbrodni
          crime
        'one of the spouses is guilty of the crime he or she has been accused of'

Małżonkowie is masculine personal and means 'husband and wife'; when either the husband or the wife is potentially the referent, then the evasive neuter is used. The neuter cannot be used in all the situations we have considered; in most the masculine is used (for examples, see (Herbert and Nykiel-Herbert (1986:67); see also Weiss (1993)). Most interestingly, the evasive neuter seems to be used in the sort of contexts which also preclude the use of generic *he* in English, that is where there are implied disjuncts, one of which is specifically female. Though a fuller analysis would be required in order to be certain, it appears that the cases that use one of the expected genders should be treated as normal case defaults, while the evasive forms are exceptional case defaults.

A final area, different to those described so far but related to the last, is that of gender resolution. It has been suggested that when agreement is required with conjoined noun phrases, then we may expect to find rules invoking the default gender. This, as the reader will probably guess, is an over-simplification; there is no ready sustainable prediction here. However, agreement with conjoined noun phrases, in those languages which have both natural conjoining of noun phrases and agreement in gender in non-singular numbers, is a fascinating problem, which will be discussed in outline in the next section.

Before moving to that topic it is worth stating that defaults of different types may or may not line up together (and when there are only two possibilities, as with two-gender systems, then the coincidence cannot be assumed to be of any

great significance). For instance, in the Russian data discussed earlier, at one level the default gender is neuter, and at another it is masculine. Then for nouns of particular declensional classes the default is feminine. Even in a two-gender system the defaults need not coincide. Recall that in Kala Lagaw Ya nouns are assigned by default to the feminine gender (only nouns denoting males are masculine). However, for a single human of unknown sex, the masculine is used (Alpher (1987:173)).[17]

4   Gender resolution

This term is due to Givón (1970) and it refers to a rule which specifies the form of an agreeing element (or target) when the controller consists of conjoined noun phrases. Resolution is generally not obligatory; instead agreement may be with one conjunct only. Where this occurs, resolution is not involved and we shall not be concerned with that construction here. As a first approximation, we may say that gender resolution rules are of three different types: some languages have rules which are basically semantic, others rely on a syntactic (or 'formal') principle, while yet others show interesting combinations of the two.

4.1   Semantic gender resolution

Gender resolution by the semantic principle involves reference to the meaning of the conjoined elements, even if this implies ignoring their syntactic gender. Examples can be found in Bantu languages. These usually have several genders, which correspond to semantic classifications only partially: nouns of the 1/2 gender typically denote humans, but not all nouns denoting humans belong to the 1/2 gender (Bantuists use labels such as 1/2 to indicate the agreements taken for singular and plural – a clear way of specifying the agreement class). For gender resolution, the important thing is whether a noun denotes a human or not, irrespective of its gender. This point is illustrated in data from Luganda (Givón (1970:253–4, 1971:38–9)). The resolved form for conjoined noun phrases headed by nouns denoting humans is the class 2 marker – the one used for agreement with plural nouns of the 1/2 gender. In (28) none of the conjuncts belongs to the 1/2 gender, but as all denote humans the resolved form is the class 2 marker:

(28)   ek-kazi,   aka-ana   ne olu-sajja   ba-alabwa
        5-fat.woman 12-small.child and 11-tall.man 2-were.seen
        'the fat woman, the small child and the tall man were seen'

---

[17] A remarkable default is found in Jarawara, a language of the Arawá family (Dixon (1995:265)); here all pronouns take feminine agreements, irrespective of the sex of the referent(s).

Clearly the use of the class 2 form as the resolved form is motivated by semantic considerations. If none of the conjuncts denotes a human, then the class 8 form is used,[18] as in (29):

(29)   en-te, omu-su,   eki-be   ne ely-ato bi-alabwa
        9-cow 3-wild.cat 7-jackal and 5-canoe 8-were.seen
        'the cow, the wild cat, the jackal and the canoe were seen'

Conjoining nouns denoting a human and a non-human produces an unnatural result; the preferred alternative is the comitative construction:

(30)   omu-sajja y-agwa ne   em-bwa-ye
        1-man   1-fell with 9-dog-his
        'the man fell down with his dog'

A similar situation obtains in several other Bantu languages, but there may be complications (see, for example, the analysis of Chichewa by Corbett and Mtenje (1987)).

4.2   *Syntactic gender resolution*

Gender resolution according to the syntactic principle means that the gender of the nouns involved is what counts, rather than their meaning. French has two genders, and if conjoined noun phrases are headed by nouns of the same gender then that gender will be used (examples from Grevisse (1964:306–7); further examples in Hybye (1944:213–17)):

(31)   un livre   et   un cahier   neuf-s
        a book.MASC and an exercise.book.MASC new-MASC.PL
        'a new book and exercise book'

(32)   la misère   et   la ruine   général-es
        the poverty.FEM and the ruin.FEM general-FEM.PL
        'the general poverty and ruin'

In many instances the marking of gender is purely orthographic in French; examples (31) and (32) have been chosen because the particular adjectives have phonetically distinct forms. They also illustrate that resolution can operate for various target types and not just for predicates.

When the conjuncts are headed by masculine and feminine nouns, then a masculine form is used:

(33)   un père   et   une mère   excellent-s
        a father.MASC and a   mother.FEM excellent-MASC.PL
        'an excellent father and mother'

---

[18] Gender 7/8 is arguably the gender which includes nouns of the widest semantic range, hence the use of the class 8 marker is understandable.

(34) un caractère   et une énergie   particulier-s
     a nature.MASC and an energy.FEM special-MASC.PL
     'a special nature and energy'

Here the rules apply similarly to animate (33) and inanimate (34) nouns,[19] though the relative frequency with which they apply is likely to differ. The rules are of the syntactic type:

(I) if all the conjuncts are feminine (syntactically), the feminine form is used;
(II) otherwise the masculine is used.

    Languages with similar resolution rules are common; they include Italian, Spanish, Slovene, Latvian, Hindi, Panjabi, and modern Hebrew (for sources and further examples, see Corbett (1991:261–306) and (2003)).[20]

4.3   *Mixed semantic and syntactic gender resolution*

The semantic and the syntactic principles of gender resolution coexist in Latin. When resolution occurs in Latin, conjuncts of the same syntactic gender take agreeing forms of that gender. Thus if all conjuncts are masculine, then masculine; if all feminine, then feminine; and if all neuter, then neuter. This is resolution by the syntactic principle. However, when conjuncts are of different genders, then the resolved form to be used depends on whether the nouns denote persons or not. For persons the masculine is used (examples are from Kühner and Stegmann (1955:44–52)):

(35) quam pridem pater   mihi   et mater
     how long.ago father.MASC me.DAT and mother.FEM
       mortu-i   essent
       dead-MASC.PL were
     'how long ago my father and mother had died'

---

[19] Alain Christol points out that, though the attested examples (33) and (34) are acceptable, they are awkward and likely to be avoided. The problem is that the plural does not have any phonetic effect in these two adjectives and so there is a feminine noun immediately followed by an adjective which is clearly marked as masculine but not as plural. In careful style the conjuncts would be reordered to place the masculine conjunct adjacent to the masculine adjective. This awkwardness is a side effect of French phonology and does not undermine the validity of the resolution rule. The problems are avoided if we look at resolution in the predicate, rather than in attributive position:

    (i)   son caractère et son énergie sont particulier-s
           his nature.M and his energy.F be.PL special.M.PL
           'his nature and his energy are special'

    Here the verb signals plurality clearly and it separates the masculine adjective from the feminine conjunct; there is no problem with examples like (i).

[20] Early Germanic had an interesting set of rules, preserved in Old High German and Middle High German, and indeed in Modern Icelandic, according to which if all conjuncts were masculine, then masculine agreements were used, if all feminine, then feminine, and in all other cases neuter. Thus the neuter covered the instances of mixed gender. For the historical data, see Askedal (1973).

For other conjoined elements (that is, when the head nouns are of different genders and do not all denote humans), when gender resolution operates, the neuter is used:

(36)   murus   et   porta   de   caelo tact-a   erant
        wall.MASC and gate.FEM from sky   struck-NEUT.PL were
        'the wall and the gate have been struck by lightning'

Here we have resolution according to a semantic principle. Thus Latin shows both semantic and syntactic principles at work.

4.4   *The relation between resolution and assignment*

The type of gender resolution system found in a particular language is not random. In Corbett (2003) it is claimed that the type of gender resolution system depends in part on the assignment system. The evidence is as follows:

> Languages with strict semantic assignment systems (like Godoberi) have semantic resolution systems, as do those with predominantly semantic systems (like Archi).
>
> Languages with formal assignment systems may have semantic resolution (Luganda), mixed (Latin) or syntactic (=formal) resolution (as in the case of French).

Thus: '*gender resolution may not be determined by semantic considerations to a lesser degree than is gender assignment*'. This basic typology covers the 'standard' examples, but there are interesting complications if a conjunct is headed by a hybrid noun. Such examples show that semantic resolution is required, even for the languages discussed in section 4.2 (Wechsler and Zlatić (2003: 171–95)). This means that resolution rules follow closely the assignment rules of a language (see Corbett (2006: 259–63) for discussion).

5   Prospects

Gender continues to be a live topic in linguistics. While the literature is considerable, there are many languages whose gender system is not adequately described; in some cases, there is little time left, since languages are disappearing fast. It is particularly urgent to document complex systems like those discussed in section 1.2. Even for apparently well-studied languages, the accounts are often only partial.

Ideally a description should include the types of agreement in gender, that is, the evidence which demonstrates the presence of a gender system. Then we would expect an account of the number of genders and of any problem cases (inquorate genders, hybrid nouns, and so on). Once given the number of genders, there should be a set of rules for assigning nouns to these genders. If gender resolution occurs, then there should be an account of the rules.

Assignment rules can be verified by investigating the assignment of invented words, by observing gender assignment by children, and by studying the allocation of borrowings to gender. In the last case, it is safest to select nouns borrowed within a specified period. For certain languages, dictionaries of new words are available, which contain only words which appeared after a certain date (though not all will necessarily be borrowings). Alternatively, both period and subject area can be limited by examining, for example, all loans relating to a specific technology or activity.

As we gain more detailed and complete descriptions of the gender systems of a wider range of languages, so we can propose more restrictive typologies. We could hope to establish the possible semantic features on which assignment can be based, the possible ways in which factors may overlap in assignment, the possible alignments of default genders, and the possible relations of resolution to assignment and to defaults.

As more gender systems are adequately described, we can also expect progress in the study of how children acquire gender systems. There is already interesting work in this area (see, for example, the work of Mills (1986); and Müller (1990, 1994, 2000)) but many studies are vitiated by an inadequate understanding of the system which the child is learning. The way in which children acquire gender systems can help us to understand better how such systems change over time (as shown by the work of Polinsky and Jackson (1999), on Tsez; see also Comrie and Polinsky (1998); for development of the work on modelling change in assignment systems, see Polinsky and Everbroeck (2003)).

Our account here has focussed on what gender systems are; this is a prerequisite for investigating the function of gender. There is great potential for the investigation of authentic spoken language material to establish what gender actually does, whether by itself or together with other linguistic subsystems. There are two studies which demonstrate that gender has a major role in the languages described. The first concerns the Australian language Nunggubuyu. In terms of its syntactic structure, Nunggubuyu appears remarkably simple: subject and object are usually not differentiated and there is almost no cross-clause relational syntax. Here the gender system 'appears to constitute the glue which holds the system together' (Heath (1983):139). A text provided shows how the verb, by indexing the different participants according to the seven genders, allows the language to function without many of the syntactic devices which are sometimes thought to be essential. In a second study, Foley and Van Valin give an account of the Papuan language Yimas and claim that the gender system 'carries most of the load of referential tracking' (1984:327). Thus gender may have a central role: in some languages, and there are many more similar to the two just noted, the reference-tracking function depends largely on gender; in others this function is shared with other devices; and in some languages gender has no place.

Besides this major function, gender may have other secondary functions in showing the attitude of the speaker. It may be used to mark status, to show respect or a lack of it, and to display affection. The use of a particular gender may be fixed for this purpose, or it may be available for 'switching' in particular circumstances according to the speaker's attitude. As an instance of its use to show status, in some Polish dialects the feminine gender is used only for women who are married. The neuter (or masculine according to dialect) is used of unmarried women (Zarba (1984–5)). Affection is shown in baby talk in Arabic by shifting gender (masculine for a girl, feminine for a boy), according to Ferguson (1964:106). In Grebo the use of non-human agreements for humans is insulting (Innes (1966:53)); for further examples, see Head (1978:175–7).

A related question to what gender does is where it comes from. In the last century there was a good deal of speculation on this topic, but more recently data have become available which give a more plausible picture.[21] Gender systems can arise from classifiers, hence ultimately from nouns. Greenberg (1978) suggested that this can be observed in the Daly languages of Australia; Reid (1997) shows this clearly.[22] Again it would be of great interest to have accounts of other languages in which the gender system is at the very early stages of development. Rather more is known about later stages in the development of gender systems. These changes may be complex and subtle, as shown, for instance, by Klein-Andreu (1996) in an analysis of various Spanish dialects.

Gender offers exciting research prospects for linguists of various types; the inherently puzzling nature of the phenomenon has been stressed by Aronoff (1998). There are also are fascinating opportunities for collaborative work. Anthropologists and ethnographers have already contributed to our understanding of assignment systems, notably those which are primarily semantic but where the semantic criteria are not fully clear. Joint work on such languages is still possible, though time is running out. Assignment systems offer scope also for collaboration with psycholinguists and psychologists.[23] For many languages, especially those with formal systems, we can now describe the assignment of nouns quite accurately (and as noted in section 2.3, we can use computational techniques to check that our analyses make the correct

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[21] See Corbett (1991:310–12) for a survey, Nichols (1989) for a different perspective, and Corbett (1991:312–18) for references on later stages in the life-cycle of gender systems.

[22] This is not the only route, however. For instance, Mosel and Spriggs (2000) suggest that gender has arisen in Teop (Nehan-North Bougainville network, Northwest Solomonic Group, Meso-Melanesian Cluster, Oceanic, Austronesian) by three distinct spatial demonstratives coming together into a system of gender-distinguishing articles.

[23] Another area of interest to psychologists, the interpretation of pronouns, is analysed in Garnham, Oakhill, Ehrlich, and Carreiras (1995), while van Berkum (1996) looks at the place of gender in word recognition and in speech production.

predictions). There is then the question of how this information is represented in the brain, as part of the goal of understanding how the internal lexicon is structured. When we consider work with sociolinguists and sociologists, where the concern is the link between language and society, we find the problems are more challenging than might have been expected. Provided we examine a wide range of languages, we discover that it is not at all straightforward to establish links between grammatical gender and the relative status and treatment of those classified by the different genders (notably men and women, though the other classifications also deserve study). This is an area where cross-linguistic work must be combined with cross-cultural research. A fourth type of collaboration is with computational linguists. We have seen how gender can provide a means for reference tracking in a language, yet it may also be absent. If this is so, then the strategies for parsing must reflect this difference. And we should be able to implement parsers to demonstrate how the different strategies work in different languages. There is much still to be learned about gender.

6   Suggestions for further reading

An account of classification more generally, including a substantial chapter on gender systems, is found in Aikhenvald (2000). Corbett (1991) contains a typology of gender systems, with reference to over 200 languages. Craig (1986) is a set of papers on noun categorization, including gender as one means of categorization. An essay which helps to distinguish gender from other means of classification is found in Dixon (1982:157–233).

Evans *et al*. (2002) provides a detailed account of a complex system, with an implementation to validate the analysis. A set of papers on languages which had previously been under-represented in work on gender systems is found in Harvey and Reid (1997). Senft (2000) is a collection devoted mainly to other systems of classification, but it includes work on gender (pp. 293–325). Unterbeck, Rissanen, Nevalainen *et al*. (2000) is another varied collection.

5   Aspect, tense, mood

Alan Timberlake

0   Introduction

To introduce aspect, tense, and mood, it might be useful to think first not of language but of a painting, *The Hunters in the Snow* (1565) by Pieter Bruegel (1525?–69).[1]

This well-known painting depicts a group of three hunters returning home to their village on a winter day, combining a number of detailed states and activities: the grey state of the sky overhead, snow covering the ground, the hunters and their dogs walking on a hill in the foreground, ice-skating on a frozen pond. In an approximate way, these scenes are like predications in language: they represent states and events of the world and of individuals in the world. As in language, events occur in places, under certain conditions, and one can identify some participants as agents (the villagers standing by the boiling cauldron) and some as patients (the pig whom the villagers are singeing in that cauldron). The whole painting is a combination of smaller scenes, just as in language individual predications are combined into larger texts. Up to a point, there is some similarity in what a painting like Bruegel's and language can do in terms of presenting an image of reality. There are, at the same time, significant differences, and these have to do in large measure with aspect and tense and mood.

In Bruegel's painting, the hunters are shown coming over the hill in the foreground and are preparing, we presume, to head down into the valley where their village is located. At that moment, from their perspective on the top of

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[1] The painting is one of five surviving from a commissioned series of pictures depicting characteristic scenes of the months (Grossman (1973:27)). The painting, in the collection of the Kunsthistorisches Museum Wien, can be viewed on the Museum's website (www.khm.at/homeE/homeE.html, through the following links: Collections / Picture Gallery / Netherlands: 16th Century / Pieter Bruegel the Elder / Hunters in the Snow). The website writes of the painting: 'The hunters are making their way back to the low-lying village with their meager bounty, a pack of hounds at their heels. Their backs are turned towards us. That, along with the perspective of the row of trees, draws the observer down into the distance, on to the remote, icy mountains on the horizon, and at the same time out of the whole cycle.' The author wishes to express his gratitude to the Kunsthistorisches Museum Wien for permission to reproduce the painting here. For a print version, (Grossman 1973:plate 88).

Figure 5.1 Pieter Bruegel, *The Hunters in the Snow* (1565)

the hill, one can see nearby that some villagers are singeing a pig in a boiling pot, and skaters are playing ice hockey further away. These events are ongoing at the time at which the hunters crest the hill, and can be seen from a point of perspective in the picture.

Language can do the same: depict states and activities that are going on at some time. And in language, as in Bruegel's painting, the speaker (artist) invites the addressee (viewer) to adopt a point of perspective from which events can be observed. Here, with respect to language, that point of perspective will be termed the *contextual* occasion.[2] The contextual occasion is a variable occasion in the narrative or discourse at which situations and changes are taken to be significant and related to other events. For example, in *Treasure Island*, the speaker – the first-person narrator Hawkins – visits the Spy-glass Tavern, where he sees the villain Black Dog and talks with Long John Silver. The speaker (narrator) leads the addressee (reader) back to this contextual occasion, his visit to the tavern, and we are informed of the situation that holds at that time: *All the time he was jerking out these phrases he was stumping up and down the tavern on his crutch*. Thus, both painting and language can transport the addressee (viewer, reader) to an internal viewpoint and exhibit scenes and activities in progress at that time, whether singeing a pig (in Bruegel's painting) or stumping up and down on a crutch (in *Treasure Island*).

From this point on, the similarities fade. The painting can basically represent only actions at a moment, as they are in progress. Language can indeed report events in progress, but, more than that, it can distinguish events in progress from other types of events – events that occur prior to the contextual occasion, or events that repeat over and over through an extended interval of time, or events that are completed. For example, if this painting were narrated in language, one could assert that the hunters first came over the hill, then arrived home, after

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[2] On 'viewpoint' in aspect, see Smith (1983, 1991). Klein's (1992) 'topic time' is analogous. A familiar and influential formulation of a similar idea is Reichenbach's 'R', for reference time, opposed to 'S' (speech time) and 'E' (event time). In Reichenbach's approach, the goal is to define various tense-aspects of English by manipulating algebraic combinations of these primitives. For example, the present perfect is $E < R = S$: that is, an event (E) occurs earlier than (hence '<') a reference time (R), and that reference time coincides with (hence ' = ') the speech moment (S). The ordinary past tense would be $E = R < S$: that is, an event E is examined from a time in the past, R, which is before S, and hence E itself is in the past.

The glory of the Reichenbachian system is that it promises a one-to-one mapping between combinations of R, S, and E and the categories encoded as morphology. At best, however, the categories it generates are those of English, not those of Russian or Lezgian or Maori. Even for English there are some mismatches between the possible combinations generated and the categories actually encoded (Comrie (1981b); Binnick (1991)). It is not clear that the notation for the perfect, in which a punctual reference time R is distinctly later than the E ($E < R = S$), adequately expresses the sense of the perfect as a state extending continuously backwards in time. It seems best to adopt a less literal and less algebraic understanding of the notions of situation (an adaptation of 'E', event) and contextual occasion (analogous to Reichenbach's 'R', reference time).

which night will fall, and there will be no further traipsing around. A painting can only show events in progress at one time, and can only hint at change, while language can explicitly differentiate stasis from change, by using distinctions of *aspect*. This is one crucial difference between language and this genre of painting.

In Bruegel's painting, the scene evidently falls at the end of a winter's day. In this way the painting indicates something about how the states represented in the painting are located in time, at least the cyclic time of day and seasons. The painting, however, says nothing about how the time of the scene depicted relates to the speaker (artist) and addressee (viewer). Language, in contrast, can indicate how the contextual occasion, and the scene that occurs at the contextual occasion, relate to the here-and-now of speech. By using distinctions of tense, language can indicate whether the contextual occasion and the reported event are earlier than or simultaneous with or later than the here-and-now of speech. *Tense*, then, is a deictic operation that locates events and their contextual occasions with respect to the here-and-now of speech. The time of speech, so crucial to language, is missing from painting, which can only reflect events in a single time and world.

In addition, Breugel's painting does not comment directly on alternatives, or *modality*. The booty of the hunters seems meagre, and the painting hints – but only hints – that the hunting could have been better. In language, it is possible to compare explicitly what has actually happened with what might have happened. Using language, one might reason: if they had hunted differently, they could have bagged more game. Or, in language, one could attempt to impose on another person an obligation to change the state of the world: 'Hunt more successfully!', their families might have said. Modality – notions of 'what if' or 'you must' or 'so be it' – can be expressed overtly and directly in language, but in painting can only be hinted at in an implicit way.

Painting and language, then, share the ability to represent reality: that is, to make predications, basically. But there is a significant difference in the treatment of times and worlds. Painting depicts events that co-occur at one time and in one world. Language allows one to locate events at a contextual occasion in relation to the here-and-now of speech (tense), to report change in states of the world in the vicinity of the contextual occasion (aspect), and to consider alternatives from the perspective of an authority (modality).

The categories of aspect, tense, and modality pervade language, from the level of the lexicon to the level of text. These categories are of interest above all when we deal with grammaticalized instances of them – with regularized combinations of lexical verbs and morphological operators that apply to lexical verbs. A wide range of morphological devices can be used – derivational morphology, inflectional morphology, verb compounds of various types (verbs and particles, auxiliary verbs and main verbs, verbs and participles). For aspect,

tense, and modality, it seems best to take a generous view of 'morphology' and include in the discussion any conventionalized and codified relationships between form and meaning that have to do with the distribution of situations over occasions (tense and aspect) and a space of alternatives (modality).

1   Aspect

Predicates report situations, and changes of situations, of the world. The states reported are sometimes the states of the world as a whole, sometimes the properties of a particular entity. Often there is one argument whose states or changes of state are central to the whole situation reported by the predicate. That privileged argument, which has come to be called the *theme* of the predicate, is the object or patient of transitive verbs (*carry*, *abandon something*) and the sole argument of intransitives (*go*, *remain*).

Predicates differ in the way they present situations. *Stative* predicates (*be trustworthy*; *like*; *be aware*; *be sad*; *be located*; *fear*; *be asleep*) report situations that do not change. Statives are the same at all moments; successive intervals do not differ, and can be expected to continue by inertia. For this reason, combining stative predicates with *for*-phrases measuring duration is awkward: *?I knew the answer for a day*. Durative phrases become natural only if there is an implicit comparison of one time with other possible times when the state might not have held – *I knew the answer for a day, but I seem to have forgotten* – or if activity is imputed to the stative: *that cat had been a terror to the neighbourhood for years* implies it was an active terror, and for much too long a time, justifying his death at the hands of a pet owl.

Next, *processes* (or *activities*) present situations that change in a continuous fashion. Processes do not continue by inertia. To continue, processes require an input of energy (*work*; *sing*; *tend the garden*; *small boys hooted*; *lurk in the grass*; *shine like stars*; *develop*; *slumber*; *chafe*; *curious faces peered*), lest the activity grind to a halt. Processes are nevertheless continuous, and successive intervals of a process are equivalent, if not identical. In contrast to statives, processes are in constant danger of ceasing, and it is therefore meaningful to measure the duration of the activity: *small boys hooted for hours*; *he lurked in the grass for days on end*.

Some lexical processes are intrinsically *cyclic*: they repeat themselves in a cycle, returning each time to the initial configuration of the world (*twitch*; *quiver*; *trample*; *jostle*; *twiddle one's thumbs*). Cyclicity is relevant not only to the lexical meaning of predicates. Cyclic (or *iterative* or *repetitive*) situations are often encoded by morphological means.

In contrast to statives and processes, which report continuous situations, some predicates report situations that change in a way that is discontinuous and irreversible. Such predicates can be termed *liminal*, or *bounded*, or *telic* (that is,

having a telos or goal or end-point). Liminal predicates have three phases: an initial phase, in which some property (of the world or of an entity in the world) does *not* hold; a transition phase, during which the property changes and comes to hold; and a final phase, in which there is no more change and the property, once established, can be expected to hold by inertia.

There are two types of liminal predicates that differ in the nature of the transition phase. *Liminal processes* (approximately Vendler's *accomplishments*) have an intermediate phase consisting of incremental changes that, like Zeno's paradox, seem insignificant at any given point but eventually add up to a definitive change. The clearest examples are predicates reporting changes in location with respect to some spatial boundary: *hasten back to the ballroom* (a process of continuing urgent movement in which the theme argument eventually crosses the boundary between two domains, the non-ballroom and the ballroom) or *place a hedgehog between the sheets* (the theme argument moves from a location in the hands of a prankster to its new goal). Liminal processes can combine with adverbs that describe the manner of the process phase in the middle. Thus in the sentence *he was resolved to skin Boko alive, lingeringly and with a blunt knife*, the process of flaying is liminal, in that the agent strives to reach a definitive change of status of the skin from its original position on Boko to off. Although the predicate is liminal, something can be said about how the middle phase proceeds – *lingeringly*, in this instance.

Other liminal predicates do not describe a cumulative result of a continuous process, but rather place a boundary on a state: *catch sight of*; *arrive at*; *fall ill*. Such predicates are then *liminal states* (approximately Vendler's *achievements*), in the sense that they report the inception of a new state. One might think of liminal states as a degenerate or reduced form of liminal processes: they are pure change; there is no extended process phase in the middle; the polarity of the state is either positive or negative; and there is little agentive control over the progress of the event. A liminal process like *climb Mt Ida* takes energy but a liminal state like *reach the summit of Mt Ida* does not – you're either there or you're not, and there is no gradual transition. Liminal states are reluctant to characterize the manner of the transition; compare the liminal process *we climbed Mt Ida slowly* with the liminal state **we reached the summit lingeringly*.

Liminal predicates present a definitive result. Accordingly, they do not combine readily with *for*-phrases that measure the time interval over which a process continues. Thus, utterances such as *?he read the newspaper cover to cover for five minutes* or *?he cooked up a pot of black beans for days* are awkward, since *read cover to cover* and *cook up* presume completion, while the phrases *(read) for five minutes* or *(gamble) for days on end* measure the duration of open-ended processes. When a *for*-phrase is used with a liminal predicate, the *for*-phrase measures the duration of the state that results after the change, not the duration

of the process. Thus the *for*-phrase in *he went outside for five minutes* measures how long his state of absence would last, not the duration of the motion. Liminal predicates can also combine with phrases that measure a larger interval of time *within which* the change occurred (*he read the newspaper cover to cover in five minutes*).

Predicates, then, report a situation distributed over time, and that situation can be uniform and stative, or processual and changing, or liminal and bounded. Each verb tells a characteristic story of stative process or liminal change. In this way, aspect is in part a property of the lexical semantics of verbs. Still, it has to be stated that the *lexical aspect* of verbs is not fixed. Many lexical units can change interpretations in context, depending especially on which arguments they are combined with. The usual interpretation of *she painted a picture* is liminal – the process is completed, and the picture should be the enduring result. But if we say *she painted one picture for seventy years*, we force the interpretation that she engaged in a continuous process of working that extended for some time, over more or less identical sub-intervals of time, without reaching the definitive result of a whole picture. *See* in English can be used in various senses.[3] *See* can report: (i) a state, in its usual momentary perceptual sense (*I see a dish*); (ii) a process involving some agency, in the sense of 'pay attention to, have contact with', when it combines with the progressive or a measure of duration (*May I not come and see you for half an hour?*); (iii) a liminal process (*she saw him to the door* – 'accompanied up to a boundary'); or (iv) a liminal state (*Looking up, as she mechanically folded the letter she saw Lord Warburton standing before her* – 'she caught sight of, began to see').

Any given lexical item thus presents a characteristic, though not rigid, view of the flow of situations over time, as uniform or changing or liminal. It is exactly because predicates have their preferred lexical histories that it is useful to have morphological operations. Aspect morphology indicates how situations are related to some occasion internal to the ongoing discourse or text, termed the contextual occasion here. As they place situations in time, these operators impose a sense of the predicate in context, and the sense that is imposed sometimes goes against the grain of the lexical aspect of the predicate. Thus, in English, the basic sense of *see* is that of a state true at an instant, as in *I see a dog*, but with a little effort (and in some languages, with explicit morphology), one can impose a process sense (*I am seeing spots everywhere*). In Russian, *kuriť* 'to smoke' is a process, but adding a prefix *za-* (meaning 'to deviate from the prior path') produces a liminal predicate *zakuriť* 'to begin to smoke, to light up'.

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[3] On the interaction between the interpretation of verbs and arguments (singular vs plural, definite vs indefinite, or referential vs non-referential), see notably Dowty (1991), Verkuyl (1993).

Aspectual operations – the semantic and pragmatic correlates of morpho-logical operations – make use of the same concepts that describe the aspectual proclivities of predicates. Much of what is called aspect, in the sense of those distinctions that are encoded in morphological distinctions, can be described in terms of four operators. These are presented below in a form that is neces-sarily idealized, because the same categories are never quite identical in two languages. In addition, it is worth keeping in mind that terminology differs in different traditions.[4]

The *progressive* (= PGR) presents the world as an activity. It establishes that a process exists – is going on – at the contextual occasion. Often the progressive implies that the activity is going on 'still' (longer than expected) or 'already' (sooner than expected) or that the activity is tenuous and about to cease. Progres-sives 'often denote a transitory as contrasted with a permanent state' (Jespersen (1924b/1965:279)). The progressive, then, establishes the fact that the process is ongoing at the contextual occasion, in contrast to the possibility that the process might not be going on.

The progressive interacts with lexical aspect. It combines naturally with pred-icates expressing processes, but it combines reluctantly with stative predicates: *Back at the shed, everyone was asleep* is acceptable, but *?everyone was being asleep* is awkward. When the progressive is in fact used with an intrinsically stative predicate, it imputes a sense of activity. For example, a characterization by an acquaintance of Bob Dylan in his early years presents what is normally a state as a kind of behaviour: *He was being kind of anti-intellectual, a primitive folk singer who couldn't admit he knew anything intellectual*; *He was being really obnoxious*. Or the progressive of a stative imputes a modal sense of tem-porariness and contingency: the world happens to be this way now, but it could easily be otherwise. In Maori (New Zealand, Austronesian), for example, the progressive of a stative, expressed by bracketing the verb with a proclitic (*e*) and an enclitic (*ana*), is used most naturally when the state continues despite expectations to the contrary:

(1)   E   poori tonu ana   te hooro
         PGR1 dark   still PGR2 the.hall
         'the hall was still dark^{PGR}'

Applied to liminal processes (Vendler's 'accomplishments'), the progres-sive implies that the event of reaching the limit might be disrupted before the limit is reached. The progressive is not natural with liminal states (Vendler's 'achievements') unless the state is in effect understood as a process. Using the progressive of a liminal state can imply that the last phase of change is

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[4] Terminology and abbreviations are explained in the 'List of abbreviations and symbols' at the beginning of the volume.

underway, and the change of state is imminent: *?The sun was shining and we were happily reaching the summit* is awkward, while *We were just reaching the summit when it began to rain* is more natural. Or applying a progressive to a liminal state paints a picture of a series of achievements (liminal states) that collectively form a process: *She's no longer recognizing old friends*.

The contextual occasion of the progressive is typically shared by other events attempting to occupy the same time. The progressive is often used to provide a background frame for other predicates that report significant change in the world: 'the effect of the progressive with its opening on to further possible development is to reinforce the disruptive effect of the intervening circumstance' (Hirtle (1967):89)). A beginning such as *In 1797, while he was helping his pioneer neighbours build a bridge* presents a situation laden with potential. It does not bode well. And in fact, in this instance, it turned out that *Joseph Palmer fell and was killed, with all his dreams unrealized*.

If a language has a progressive, it has to be distinguished from some other way of reporting situations, which, for want of a better term, might be called 'neutral' (= NTL). Progressives in different languages, in opposition to neutral aspect, differ in how extensively they are used, in a way that often reflects diachronic change. In an early stage of development, an incipient progressive insists on the unexpected nature of the ongoing activity. For example, in Lezgian (Nakho-Daghestanian), the progressive (or 'continuative') imposes the modalized sense that the activity continues longer than anticipated (Haspelmath (1993):145)). The derivational progressive in Oneida (Iroquoian) has a sense of extended and continuous motion: 'keep on going along doing something'. Lithuanian is developing a new progressive, a periphrastic combination of 'be' and a present active participle prefixed with a continuative marker *be-*. With lexical activities it is used preferentially with a modal–aspectual adverb *jau* 'already', that is, 'sooner than anticipated':

(2)   Jis jau   buvo   užstalėje be-sėdįs
        He already be.PST at.table PGR-sitting.PCP.MSC.SG
        'he was already sitting at the table'

With a liminal predicate (3), this emerging construction means that an imminent event is interrupted just before it has a chance to become actual (Ambrazas, Bemadišienę, and Dumašiūtė (1971)).

(3)   Jis jau   buvo   ją   be-čiumpąs   už kaklo,   bet . . .
        he already be.PST her   PGR-grabbing.PCP.MSC.SG   around.neck   when
        'he was already grabbing [just about to grab] her around the neck, when . . .'

From such restricted beginnings a developing progressive construction comes to apply to more situations and becomes more general. If a progressive develops

long enough, it may come to report any incomplete activity, and appropriately be termed imperfective.

The progressive, then, presents a situation that changes, or could possibly change, in the vicinity of the contextual occasion.

A second operator makes extended states out of situations by repeating a situation over multiple occasions. *Iterative* (or *serial* or *periodic* or *cyclic* or *habitual*) situations are then complex states composed of equivalent sub-situations in which activity alternates with the absence of activity. Iterative situations can be evaluated by languages in different ways. Iterativity can be expressed by non-actual modality (in English, the modal auxiliary *would*, as in *he would often break into song*, or by the future in Lezgian), on the grounds that each sub-situation is potential, possible, but not actual, and there is usually a hint of contingency: *he would often break into song when the spirit moved him*. Another possibility, discussed below, is that iterative situations are expressed by the imperfective, inasmuch as the total iterative predication amounts to a continuous state. Iterativity (and plural quantification of the arguments) can change a liminal predicate into a process (*he was always going around throwing bouts*).

Iterativity can be expressed by its own, distinct morphological means. Iterativity is often expressed derivationally, reduplication being a favourite, iconic, device; note Tübatulabal (Uto-Aztecan) *ánaŋát* 'he is crying', *ánaŋáːʼát* 'he is crying repeatedly'; *lahyát* 'it is loose', *láixlahyát* 'it is getting loose repeatedly' (from Voegelin (1935a:109–10), here in slightly modified transcription). Czech expresses iteration by adding an extra derivational affix to the imperfective stem of some verb classes: compare perfective *dát* 'to give (on one occasion, definitively)', imperfective *dávat* 'to be giving, attempting to give', iterative *dávávat* 'to give repeatedly', or imperfective *chodit* 'to walk', iterative *chodívat* 'to walk repeatedly', and in folk speech even a double iterative *chodívávat* 'to walk around repeatedly' (Petr (1986:85)). Irish distinguishes iterativity and progressivity, and therefore has four aspectual possibilities in the past (Ó Baoill (1994:205)). Speaking of Seán engaging in an activity of tea-drinking at six o'clock, one may use: a punctual past *d'ól* 'drank'; an iterative *d'óladh* 'used to drink'; a periphrastic progressive (with the subject noun interposed) *bhí Seán ag ól* 'Sean was [at the] drinking'; or a progressive iterative *bhíodh Seán ag ól* 'Sean used to be [at the] drinking'. Progressive and iterative in Irish are then cross-classifying categories.

The third idealized operator, the *perfect* (= PF), presents a situation as a state. The contextual occasion of a (present) perfect includes the here-and-now of the speech event and extends back, as a continuous interval, to include the actual event reported by the predicate.[5] To illustrate, a discussion of the

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[5] Analyses of the perfect (Jespersen (1924b/1965); Maurice (1935); Bryan (1936); Bennett and Partee (1972); McCoard (1978); Mugler (1988); Klein (1992); Michaelis (1998)) are more similar

arduous process of restoring the Hermitage (the Tennessee home of American President Andrew Jackson), including restoring the wallpaper hand-blocked with an epic theme, reports various steps that were taken: *Curators let it be known they were in the market for the Telemachus paper . . . They contacted the Louvre . . . A French family eventually advised one of the institutions that they were dismantling their summer home . . . The Hermitage bought the paper . . .* And then the discussion comes to the installation of the wallpaper. A past tense – *It was rehung in the upstairs hall by a crew who specialize in historic work* – would continue the story of the wallpaper in narrative sequence with the other past events, without association with the present. It would leave room for other liminal events to intervene between the events narrated and the present; there is no particular expectation about its present state or whether one could expect to see it now in Tennessee. But shifting to the present perfect at this point in the discussion – *It has been rehung . . .* – closes off the sequential narrative of the past and returns the perspective to the present state of restoration. The perfect invites expectations about what is possible in the future; for example, a tourist could now expect to see the wallpaper.

More broadly, the difference between a past tense and perfect is one of orientation and continuity. With the past tense, earlier situations are examined from a time in the past and viewed as disconnected from the present. In one formulation: 'the [past] tense represents an action or state as having occurred or having existed at a past moment or during a past period of time that is definitely separated from the actual present moment' (Bryan (1936:363); similarly Binnick (1991:103)). It is 'separated' in the sense that there is much water under the bridge: the results of situations that developed in the past could be long submerged and overlaid by further changes; other events could intervene between the past event and the present; the past event has consequences for the immediate vicinity of time in the past, but not necessarily in the present. For example, in the now classic sentence *I didn't turn off the oven*, there was a past contextual occasion when turning off an oven was possible and expected. Now other events (leaving the house, driving down the turnpike) mean that there is no possibility of reversing the result. In contrast, the perfect speaks of the state of the present world and how it arose and how it might be expected to develop. Thus the perfect in *I haven't turned off the oven* allows one to think that it might be better if the past had been different and possibly that a future action (a U-turn?) would still be possible and desirable. Past and perfect, then, not only characterize the past, but suggest different ways of viewing what other situations are possible or likely in the present and the future.

than might appear. The pendulum has swung toward the view of the perfect as an 'extended now' rather than as an expression of the 'current relevance' of a resulting state. Yet if 'the perfect requires a reference period which is, or includes, the present' – which is the view of the perfect as extended now – 'it does so because only thus is it currently relevant' (Binnick (1991:383)).

Perfects, although they all report an extended state, can do so in somewhat different ways, along more than one parameter. One parameter has to do with quantification of the situation and time intervals (Mittwoch (1988)). Some perfects are *existential*: what is relevant is the mere fact of a state having been in effect, or a liminal event having occurred at all, at some anterior time – *I have been to England before, but have never enjoyed it much*. In contrast, a *universal* perfect reports a situation that holds continuously over all subintervals of an extended interval from the past up through the present. The sense differs depending on the lexical aspect of the predicate. A non-liminal state or process continues into the present – *'I care only for you.' 'You have known me too short a time to have a right to say that.'* – the acquaintance is presumed to be continuous; similarly, *I am sure she has lived all her life in a boarding-house* – the living is continuous over the named interval (here, *all her life*). If the predicate is not a continuous process or state but a liminal one, so that it reports a significant change, what endures is not the process, but the result of the change: *'I had something particular to say. You've never asked me what it is. Is it because you've suspected?'* – there was a liminal event of forming a suspicion, and once that suspicion formed, it was maintained through all subintervals up to the present. Existential and universal readings of the perfect are natural with different types of durational intervals. In an existential reading, there is one occasion that falls within a continuous interval of possible occasions, *Since 1942, John has been to Boston only once*. In the universal reading, as in *John has been in Boston since yesterday*, there is a continuous activity or state that held universally over *all* relevant subintervals.

A separate parameter is *whose* enduring state the perfect characterizes. The state can be a property of the theme argument – the property likely to change as the result of a liminal action: *'No, I'm not easily charmed! But you have charmed me, Miss Archer'* – what is relevant is the continuing state of the enchanted person, which is the theme argument of the transitive verb *charm*. Or the property can be a property of the agent: *Perhaps you have married a lord. I almost hope you have*. Or the state can be the state of the world in general. In such instances, the new state of the world is unexpected – that is, it is 'hot news'. Thus *LBJ has just announced that he will not run for president* is a statement about the recent transformation of the whole world more than it is a statement about one individual.

In context, then, perfects can acquire different readings along two axes, depending on whether the quantification of the subintervals is existential or universal, and whether the state is the state of the theme, or of the agent, or of the whole world.

Because perfects comment on how the current situation arose out of a prior situation, the prior situation is embedded in an extended interval of the present and is accessed from the present. As a consequence, the time of the actual event

is part of the extended interval that includes the contextual occasion, and that interval can be named (*John has dug up the garden twice since January*). The time of the event cannot be named by precise temporal adverbs (**John has dug up the garden* {*two years ago* / *in January* / *at noon*}).

A perfect situation can be viewed from various contextual occasions. When the contextual occasion is the time of speech, it is a present perfect. If the contextual occasion is moved into the future or the past, one gets a future perfect or a past perfect (or *pluperfect*). Perfects set in the past and future are less finicky than present perfects (Klein (1992)). They insist less on a continuing result and pay more attention to the event itself. They even allow one to name or ask about the specific time when the event itself actually occurs: *When do you think he* {*had ˜?has ˜ will have*} *finished the project?* Similarly, *What had happened was that, shortly before, at three o'clock, his fate had been sealed* is normal for Henry James, whereas it would be awkward for anyone to say *?At three o'clock, his fate has been sealed*. In the past and future, the perfect is less concerned with the resulting state and more with the location of one situation relative to another. In this respect the future perfect and past perfect could be termed 'relative tenses' (see below).

Perfects are commonly expressed by periphrastic morphology. Perfects develop historically by agglutination of particles like 'already' (the perfect adverb *par excellence*), or from verbs meaning 'finish' or 'arrive' or the like, or from constructions with auxiliaries and participles or verbal nouns expressing result or possession.

As a new perfect develops historically, it will begin by being used in the most exemplary situations. Lithuanian is developing a participial perfect. To use this new perfect, the predicate has to be a liminal one leading to a tangible, enduring result (Ambrazas *et al.* (1971:148–51)). In Lezgian, the perfect in *-nwa* often has a sense of counter-to-expectation immediacy (*kwez telegramma ata-nwa* 'for you a telegram has come!'). It is also used with positional predicates, when what is important is the resulting static position more than the event that has led to the new position: *acuq'-nawa* 'having sat', that is, 'in a seated position'; *ksa-nwa* 'asleep' (Haspelmath (1993:144)).

The fourth aspectual operator, *perfective aspect* (= PFV), imposes boundaries on situations at the contextual occasion. A perfective presupposes a situation consisting of three phases: a prior situation in which there is no activity or no state holds, then a phase of change and transition, and an ensuing situation after which no more change is to be expected and the static situation that results should remain in force for the foreseeable future. There is a limit on the interval of change; in this sense a perfective event is bounded, liminal.

The perfective operator interacts with the lexical aspect of the predicates to which it applies. Predicates that are intrinsically liminal (predicates with meanings like 'walk to', 'read through', 'disperse', 'catch sight of') occur naturally

in the perfective without further ado. States and processes, left to their own devices, would rather not occur in the perfective. If the predicate is a pure process predicate (one lacking a goal), bounding can mean just placing a limit on its duration. A perfective of plain 'work' or 'walk', if understood as an activity and not locomotion to some destination, is only 'work a bit' or 'walk for a while'. Making a perfective of a cyclic (iterative) process means focussing on a single token of the serial process, in the way that, to use an English example, *I saw him look at Boko, and quiver*, the last event *quiver* is one (*semelfactive*) token of the cyclic process of quivering. English does not have perfective morphology, but the context imposes a liminal reading on the cyclic verb. Russian would use explicit perfective morphology here, in this instance the suffix *-nu-*: *drožat'^{IFV}* 'quiver, tremble repeatedly' vs *drognut'^{PFV}* 'quiver, tremble once'. When liminal (or perfective) aspect is forced on a stative predicate, it makes it a liminal state – that is, a change of state. As Goodwin (1880:24) stated long ago with respect to the Greek aorist (a liminal aspect, similar to perfectives in other languages), 'the aorist of verbs that denote a state or condition generally expresses the entrance into that state or condition'. Goodwin's examples contrast the present, as in *basileuō* 'I am king', *ploutō* 'I am rich', with the aorist, as in *ebasileusa* 'I became king', *eploutēsa* 'I became rich'. Similarly, when in Maori the perfective aspect marker *ka* can be applied to the so-called 'neuter' predicates, like *mate* 'to be dead, extinguished' or *mutu* 'to be finished, brought to an end', it indicates the 'entrance into the state':

(4)   ka   mutu   te kai
        PFV   be.finished the.food
        'the food got finished^{PFV}'

Because the perfective presents a bounded event, temporal adverbs are understood to refer to specific occasions. For example, *He emigrated before the war* implies that emigration, a relatively punctual event, occurred at some specific time that falls somewhere within the broad time interval *before the war*.

Perfectives have a characteristic function in texts: the perfective is the aspect of narrative. A perfective reports a departure from the prior situation whose result can potentially endure. The final, resultative phase of the perfective becomes the background condition – the initial phase – for the next event. In general, then, a string of perfectives normally gives a narrative – a sequence of change and stasis, change and stasis.

If a language has a perfective – a morphological operator that expresses events that are limited – then it must be distinguished from some other way of presenting actions. Generally the category opposed to the perfective is termed *imperfective*. In Greek, the liminal category in the past tense is termed *aorist* (= AOR), and it is opposed to *imperfect* (= IF). Some other traditions use one or both of these terms. In a sense all an imperfective does is indicate that a

situation is *not* perfective – that it is not liminal – but there are differences in how languages interpret which contexts fail to be bounded and perfective. Included are one or more of the following specific contexts: (i) the progressive – a process actually in progress at some contextual occasion; (ii) analogously, a state that holds at some contextual occasion; (iii) an iterative process – one that repeats; (iv) a delimited or *durative* sense, used with processes that extend for some period of time but cease ('walk for two hours'). These are specific and identifiable contexts. Not all uses can be so clearly defined. Sometimes, (v) the imperfective seems merely to establish the existence of a state or activity as opposed to its absence (*Many of our kindergarteners read*; *The Danube flows into the Black Sea*; *The roses twist around the lattice*) or to provide description (*She sat motionless and empty-handed*). Note that these situations (*read*; *flows into*; *twist around*; *sat motionless*) are not 'activities in progress', to judge by the fact that English is not obliged to use its progressive, but they would typically be imperfective in a language that opposes perfective and imperfective.

Sometimes the motivation for choosing between two aspects is quite subtle and has to do with different views of what objectively might seem to be the same event. In Greek, one finds that 'the imperfect is sometimes found in simple narration, where the aorist would be expected' (Goodwin (1880:7)), such as the second event of giving in: *This he said, and lifting off his broadsword, / silver-hilted, in its sheath, upon / The well-cut baldric, made a gift* [dōke^{AOR}] *of it. / and Aías gave* [didou^{IF}] *his loin-guard, sewn in purple* (*The Iliad* VII.303–5: Homer (1974)). The two events seem quite similar, and the change from aorist to imperfect surprising. But perhaps there is a difference after all. The aorist here (*dōke^{AOR}*) reports the 'simple momentary occurrence of an action in past time' (Goodwin (1880:24)). After the first event has occurred, a second act of giving in this reciprocal ritual is expected. The imperfect (*didou^{IF}*) puts the emphasis on the content of giving, roughly 'what Aías gave in return was . . .' This subtle difference seems to be an instance of shifting from narrative (aorist) to description (imperfect). The broader point here is that, when there is an opposition of perfective and imperfective, there may be uses of the imperfective that are difficult to assign to one of the easily recognizable contexts.

There are differences among languages in the range of usage of perfective and imperfective (Dahl (1985)). In Lezgian (Haspelmath (1993)), the aorist, or perfective, which is marked by the suffix *-na*, is used for liminal events in the past, when it puts events in sequence:

(5)   ada sa   q̃arpuz q'ence'ikaj   xkud-na
       it   one melon   from.under.tendril take-AOR
          . . . k'irer ak'ur-na   . . . kulariz   qʰfe-na
             fangs stick-AOR into.bushes return-AOR
       it took^{AOR} one melon out from under the tendril, . . . stuck^{AOR} its
       fangs in, . . . returned^{AOR} into the bushes'

In contrast, the imperfective, formed with a suffix *-z(a)wa* (past tense *-z(a)wa-j*), is used for: (i) activities in progress (6); (ii) stative situations holding at some time (7); (iii) often for iterative activities or habits (8), the imperfective now being 'in fact preferred to the Future in this function'; and (iv) to provide *description* of a process (9).

(6)   jab gu-zwa-ni
      ear give-IFV.PRS QUESTION
      'are you listening*IFV.PRS*?'

(7)   zawaj uğri q'az že-zwa-č
      I   thief catch can-IFV-NEG
      'I cannot*IFV* catch the thief'

(8)   inra har   jisuz bustanar ca-zwa
      here every year gardens sow-IFV
      'every year [they] plant*IFV* gardens here'

(9)   abur sekindiz fi-zwa-j
      they quietly   walk-IFV-PST
      'they walked*IFV.PST* [were walking?] quietly'

But, as in (10), in Lezgian it is the aorist, not the imperfective, that is used for durative contexts – for states and activities that go on for a specified interval of time and then cease.

(10) ŝa gerenda abur q'wed-ni kis   x̂a-na
      some while   they two also silent be-AOR
      'for a while they both were silent*AOR*'

  Russian uses an imperfective in all contexts where Lezgian would do so, and quite likely more. The general system of Russian is the following. Ordinary verbs without prefixes report states or processes and are generally imperfective: *vjazat́* 'tie, bind', *žat́* 'squeeze', *myt́* 'wash'. To these bare verbs, one can add prefixes, which impose spatial or abstract limits on the activity. Into the bargain, they make the derived verb perfective. Thus the prefix *pod-* 'under' gives *podvjazat́* 'tie up from underneath', *podžat́* 'tuck under', *podmyt́* 'wash underneath'; *ot-* 'away, off' gives perfectives *otvjazat́* 'untie', *otžat́* 'wring out', *otmyt́* 'wash off'. Once the prefix is added, the resulting verbs are lexically liminal, or telic: they have a telos, or goal. Used in this form, these prefixed telic verbs – *podvjazat́*, *otžat́*, *otmyt́* – will be perfective.
  What makes the Russian aspect system distinctive is the possibility of applying a derivational suffix to these prefixed verbs that are liminal (telic) and deriving imperfectives, which maintain the sense that the activity could have a possible limit: *podvjazyvat́* 'engage in the process (repeatedly, or now at this moment, or as a general characteristic) that could lead to tying up something

from underneath', *otžimať* 'to engage in the process of wringing out that might lead to definitive and final removal of moisture'. These derived imperfectives indicate that an activity *might* have a limit but, at the same time, that the event does not actually reach this limit on this contextual occasion. Thus, the perfective in (11) means that there was a single act in the past that led to the result that there was no more cloth-wringing to be done (at that time, in that world):

(11)   On   otžal   skatert′
         He   wring.out.PST.PFV   tablecloth
         'he wrung out[PFV] [engaged in the activity of cloth-wringing, and indeed definitively wrung out] the tablecloth'

The imperfective *otžimal[IFV]* in (12) describes a situation that fails to lead to a definitive conclusion. For example, one and the same imperfective verb form *otžimal[IFV]* could be used for any of the following situations: (i) an event in progress at the contextual occasion (*Kak raz, kogda ja vošel[PV], on otžimal[IFV] beľe* 'Just exactly when I came in[PV], he was wringing out[IFV] the laundry'); (ii) a repeated event (*On otžimal[IFV] trjapku každye tri minuty* 'He wrung out[IFV] the rag every three minutes'); (iii) an event carried out for a period of time without completion (*Dvadcať minut oni otžimali[IFV] ètu ogromnuju skatert′* 'For twenty minutes they kept wringing out[IFV] that enormous tablecloth'); and (iv) to describe the manner of a known event (*Skatert′ on otžimal[IFV] neobyknovenno tščateľno* 'The tablecloth he wrung out[IFV] with unusual care').

(12)   On   otžimal   skatert′
         He   wring.out.PST.IFV   tablecloth
         'he wrung out[IFV] [engaged in the activity of cloth-wringing, but did not finish wringing out] the tablecloth'

Another example of the latter sense of the imperfective is (13), where the focal information is *how* Boris Leonidovič Pasternak participated in this liminal event:

(13)   Boris Leonidovič   umiral   v   soznanii
         Boris Leonidovich die.PST.IFV   in consciousness
         'Boris Leonidovič died[IFV] in consciousness' = 'Boris Leonidovič was conscious when he died'

These contexts in (i) through (iv) above are united by the fact that, in one way or another, the process of cloth-wringing has not led to the possible result that all of the moisture is wrung out of a cloth on a specific occasion, as the perfective *on otžal[PFV] skatert′* 'he wrung out the tablecloth' would indicate. What is unusual about Russian aspect is exactly these secondary imperfectives, which signal frustrated liminality: they are liminal at the lexical level – the

prefix points to the existence of a *possible* limit – but the imperfectivizing suffix indicates that the event fails to reach that limit in the vicinity of the contextual occasion. It is presumably for this reason that Russian uses the imperfective, not the perfective, to express a delimited duration of the activity (as in context (iii) above: the activity has gone on that *could have* led to a definitive result, but it did not).

Palauan is surprisingly similar. If someone is reading a book, the past imperfective *milęnguiu* means 'the action is described as having continued for some period of time, but no claim is made that it was completed', while using the perfective *chiliuii* would mean there is 'no more of the book to read' (Josephs (1975):254)). Accordingly, if a past activity occurs over an interval from seven to eight o'clock, the imperfective is used, since using the perfective would lead to the curious idea that 'the moment of completion lasted a whole hour' (1975:262).

In both Russian and Palauan, then, the perfective implies not only that an activity or state stops, but that it has reached some intrinsic limit. If an activity continues for a specified interval of time but does not reach that limit – if 'he read the book for two hours', engaging in an activity but not reaching the limit – both languages use the imperfective. As it happens, Russian and Palauan are typologically unusual in this respect.[6] Most languages use the liminal aspect for such situations. Lezgian, as just noted, uses its aorist (perfective) for these contexts in which an activity stops (10). Mandarin is similar. In Mandarin, the postverbal particle *le* is a perfective marker. *Le* is used in contexts in which something is measured and bounded, whether the quantity of an affected argument (14) or the duration of the activity (15):[7]

(14)   tāmen fā-le   wu-shí-ge qǐngtē
        they   issue-PFV fifty   invitation
        'they sent out*PFV* fifty invitations'

                                        C. Li and Thompson (1981: 190)

(15)   wo zài nàli zhù-le   liǎng-ge yuè
        I   at there live-PFV two   month
        'I lived*PFV* there for two months'

                                        C. Li and Thompson (1981: 186)

It is not necessary that the activity be brought to any goal or intrinsic limit, only that the activity be delimited or measured. In similar contexts, Greek normally uses the aorist, its liminal aspect:

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[6] Dahl (1984) and Bybee and Dahl (1989:88) report the imperfective being used in this context in only a quarter of the sample languages with imperfective.
[7] See discussion in Smith (1991:344–8).

(16)   ebasileuse deka etē
          reign.AOR ten   years
          'he reigned^{AOR} ten years'

The aorist indicates that these ten years are 'now viewed as a single event', and could be glossed as 'he had a reign of ten years'. There is no question here of reaching an intrinsic limit, just limitation in time. Using the imperfect here would emphasize continuation against the assumption to the contrary: *ebasileue^{IF} deka etē* 'he continued to reign^{IF} ten years' (Goodwin (1880:24–5)).

Thus, in idealized form, a perfective insists that all activity or all change in a situation is confined to the period included in a specific contextual occasion. The imperfective fails to be perfective in some way. Obviously, unchanging states and activity in progress will count as imperfective. There are differences across languages in how the more specific contexts – iterative or durative – are treated.

Aspect shades into tense. A clear differentiation of tense and aspect requires at least three forms. In a system opposing only two forms, it can be difficult (and perhaps not important after a point) to determine whether the system is more one of tense or one of aspect. The question has long been debated with respect to Arabic (Binnick (1991)). Probably a binary system should be taken as more aspectual than temporal, and we should say: perfective, which implies past, is opposed to imperfective, which implies present.

A perfective requires a temporal perspective that encompasses the phase of change in order to evaluate the situation as finished (completed, terminated), and for this reason is basically incompatible with an event that actually occurs during the present time. Still, one sometimes finds the morphology of perfective combined with the morphology of present tense, if some meaning can be assigned to the combination. Nugunu (Bantu, Cameroon, see below) distinguishes perfective and imperfective in all of its seven tenses, one of which is the present. The present perfective reports an imminent event (*a dɔ́mba* 'he is about to leave'). In Palauan, there is a present perfective, which is likewise used for imminent events. In Nomaande, another Bantu language of Cameroon with a similarly rich tense system, the present perfective reports a habit, or really a potential event – something a person 'will do' whenever an opportunity arises (Wilkendorf (1991:122)). The event itself is not actually in progress during the here-and-now of speech, but the potential for the event exists now in the present. In Lezgian the aorist can be used with both tenses, neutral and past. The neutral tense of the aorist is understood to be intrinsically past (17). Adding the past tense suffix *-j* to the aorist puts the event in the *remote* past; it is a situation or resulting state that used to hold long ago but that has ceased by a contextual occasion in the past (18).

(17) za sa čar-ni   kx̂e-na   . . .
      I one letter and write-AOR
      'I wrote$^{AOR.NTL}$ one letter and . . .'

(18) shift q'we wacra   ada waxtwaxtunda čarar kx̂e-na-j
      first two months she time-time   letters write-AOR-PST
      'in the first two months she wrote$^{AOR.PST}$ letters time and again
      [but ceased]'

These examples confirm that liminality, or perfective aspect, ordinarily points
to a time other than the actual here-and-now of speech, and that perfective has
specialized functions when it, exceptionally, does form a present tense.

   Diachronically, imperfectives develop out of certain characteristic sources.
One possibility is that, as a language develops overt perfective morphology,
the imperfective will be the residual absence of morphology, as in Mokilese
(Austronesian). In Mokilese there are three aspects: perfective, imperfective,
and progressive (Harrison (1976)). Perfectives are marked with one of a set of
suffixes (*dolih-di* 'pick off, pluck', *dolih-da* 'gather up', *dolih-la* 'pick all'). A
perfective indicates completed action (19). A reduplicated form is used specif-
ically for actions in progress (20).

(19) ngoah repahkih-di ih   aio
      I   search-PFV   him yesterday
      'I searched for^{PFV} [and found] him yesterday'

(20) ngoah rap-rapahki ih   aio
      I   PGR-search him   yesterday
      'I was searching^{PGR} for him yesterday'

The third aspect is just the plain verbal stem that is neither suffixed (perfective)
nor reduplicated (progressive). This neutral, or imperfective, aspect is compat-
ible with a range of situations (21).

(21) ngoah raphaki   ih   aio
      I   search.IFV him   yesterday
      'I {searched for ∼ tried to search for ∼ was searching for}^{IFV}
      him yesterday'

   Another source of imperfectives is iteratives or progressives. Such a change
is not instantaneous. An interesting case is Chamorro, in which there is a con-
trast between the 'neutral' aspect (the stem form) and a reduplicated form.
With a process, reduplication normally indicates activity in progress, while
the unreduplicated form typically is understood to refer to events in the
past (22):

(22)   {maigu′   ∼ mämaigu′} i ga'lagu
          sleep.NTL   sleep.PGR   the.dog
       'the dog {slept^{NTL} ∼ is sleeping^{PGR}}'

But reduplication can also be used for repeated actions (23), suggesting that this form may be on its way to becoming a general imperfective.

(23)   i pigua′   pupulu yan ufuk ni
       the.betelnut leaf   and lime and
          {mana′fandänña′   ∼ mana′fandädanña′}
           get.combined.NTL   get.combined.PGR

       pues {manganages   ∼ mangángangas}
       then get.chewed.NTL   get.chewed.PGR
       '. . . the betelnut, the leaf, and the lime, which are combined and
       then chewed'

Yet it is not obligatory in this sense, and in fact is avoided with explicit markers of iteration like *käda birada* 'every time', when it would be redundant; in this respect the development is still partial.

   Even if a language already has an imperfective, in the sense of an aspect reporting a range of aliminal activities, it is still possible to develop a progressive that emphasizes ongoing activity. In Basque, there is a newer analytic imperfective that is formed with an auxiliary and the inessive case of a verbal noun. It has completely displaced the older synthetic form for most verbs. With the small number of verbs that still contrast the two forms, the newer analytic form is said to be more specifically progressive than the older synthetic form (Haase (1994)). A new progressive can compete with and eventually displace the older imperfective, as the *iyor* progressive has been doing with the *ir* imperfective in Turkish (Lewis (1967); Thieroff and Ballweg (1994:36–8)). The possibility of changing gradually from progressive to a more general imperfective indicates that there is no sharp boundary between these categories.

   Aspectual concepts are manipulated in yet another way in Iroquoian languages. In Iroquoian languages such as Oneida,[8] there are maximally four categories. One is the modal category of imperative:

(24)   k-atekhuní-Ø
       1SG.AGT-eat.meal-IPV
       'may I eat a meal^{IPV}'

The remaining three, more strictly aspectual, categories are both lexical and contextual. Many verbs are lexically stative and occur only in the stative aspect:

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[8] Forms, cited in explicit morphemic transcription without various phonological reductions, are based on Lounsbury (1953: esp. 39, 85–9, 96) and Michelson and Nicholas (1981), with helpful interpretation provided by Marianne Mithun, whose forthcoming grammar of Mohawk will contain a full description of a similar Iroquoian system.

(25)   yo-hnil-ú
        NTR.PAT-solid-STV
        'it is solid^{STV}'

Intransitive event verbs, which report change, occur in all three aspects. When the *stative* aspect (= 'STV') is applied to event verbs, it imposes the sense of a state.[9] The imposed state can be the result of a liminal act, much like an English perfect (the second verb, 'frozen over', of (26)), or the static fact that a process is ongoing at some specific time, much like an English progressive (the fourth verb, 'wait', in (26)):

(26)   nʌ   y-aʔ-hla-atkatho-ʔ   s-yo-wislatu-ʔ
        now   TRANSLOC-PST-MSC.AGT-look-PFV   ITT-NTR.PAT-freeze-STV
            neʔ   tsiʔnaheʔ   tho   hla-iʔtlu-ʔ   hlo-atnuhtuʔtu-u
            then while   there   MSC.AGT-sit-STV   MSC.PAT-wait-STV
            a-hla-itsyayena-ʔ
            IRR-MSC.AGT-catch.fish-PFV
        'now he saw$^{PST.PFV}$ it had frozen over^{STV} again then while he
        was sitting^{IFV} there waiting^{STV} to catch fish$^{IPR.PFV}$'

The second aspectual category of event verbs is the imperfective, used for iterative habits that hold at all times (27) and for activities in progress on a specific occasion (28):

(27)   k-atekhu·ní-heʔ
        1SG.AGT-eat_meal-IFV
        'I eat a meal^{IFV} / I'm eating a meal^{IFV}'

(28)   hla-anitsyatolat-s
        MSC.AGT-fish.hunt-IFV
        'he is/was fishing^{IFV}'

   The other aspectual category of event verbs is perfective:

(29)   waʔ-k-atekhu·ní-ʔ
        PST-1SG.AGT-eat.meal-PFV
        'I ate a meal$^{PST.PFV}$'

(30)   ʌ-k-atekhu·ní-ʔ
        FUT-1SG.AGT-eat.meal-PFV
        'I will eat a meal$^{FUT.PFV}$'

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[9] On the sense of stative aspect in Oneida, see Chafe (1980). Aspect also interacts with argument marking in the verb (Mithun (1991)). Lexically stative verbs can take either agentive (= 'AGT') or patient marking (= 'PAT') in the pronominal prefix, according to whether the state reported by the verb is intrinsic ('be flat', 'be thick', with the agentive prefix) or contingent ('be dangerous', 'be damp', with the patient prefix). Most event verbs take an agentive pronominal prefix in the imperfective and perfective but switch to patient marking in the stative aspect.

Table 5.1 *Use of imperfectives in some languages*

	stative	iterative	progressive	durative	punctual
English	NTL	NTL	PGR	NTL	NTL
Chamorro	NTL	NTL ∼ PGR	PGR	NTL	NTL
Oneida	STV	IFV	IFV ∼ STV	PST.PFV	PST.PFV
Mandarin	NTL	NTL	PGR	PFV	PFV
Lezgian	NTL	NTL	NTL	AOR	AOR
Greek	IF	IF	IF	IF ∼ AOR	AOR
Russian	IFV	IFV	IFV	IFV	PFV

(31)   a-k-atekhu·ni-ʔ
        IRR-1SG.AGT-eat.meal-PFV
        'for me to eat a meal[*IRR.PFV*]'

As in the examples above, the perfective is not used alone, but must be combined
with an additional temporal–modal prefix: past (as in (29) or the first verb in
(26)), future (30), or an all-purpose irrealis (as in (31) or the last verb in (26)
'catch fish'). The combination of perfective and past is suited for sequential
narrative (the first four events of (32)):

(32)
y-a?-hla-anitahsʌht-eʔ   . . . wa?-hlo-ita?w-e?
TRANSLOC-PST-MSC.AGT-tail.immerse-PFV   PST-MSC.PAT-sleep-PFV

  . . . t-a-hla-atihʌtho-?   . . . y-a?-hla-atkatho-?
      CISLOC-PST-MSC.AGT-jerk-PFV   TRANSLOC-PST-MSC.AGT-look-PFV

  ni-s-hla-itahsut-e?
  PARTITIVE-ITT-MSC.AGT-tail.attach-STV

'[the bear] immersed his tail[*PST.PFV*] . . . fell asleep[*PST.PFV*] . . . he jerked[*PST.PFV*]
. . . he saw[*PST.PFV*] . . . he has lost his tail[*STV*]'

The affinity of the perfective in Oneida with past, future, and irrealis – for
time-worlds other than the here-and-now – is reminiscent of perfectives in other
languages.

Some of the systems discussed here that make use of a progressive and/or
imperfective category are summarized in schematic form in table 5.1. The
table, constructed on the assumption that contexts can be identified univer-
sally across languages, ignores some of the more idiosyncratic uses, like the
imperfective used for description. The punctual context is cited as a con-
trol category, being the context that, by definition, is not expressed by an
imperfective.

As can be seen from the tabular display, there is no single pattern of organizing the uses of aspects termed imperfective or perfective. In some languages, there is a specific perfective aspect used for liminal events, while a default category – imperfective or neutral – is used for other situations. In some cases, the form signalling aliminal aspect – 'imperfective' – has some more specific meaning such as progressive or iterative.

Although the four operators progressive, iterative, perfect (and stative), and perfective seem to be the most frequent aspectual operators, others are occasionally found (Bybee, Perkins, and Pagliuca (1994)). One possibility is to mark the phases of an event. Kako (Bantu in southeast Cameroon) has perfective and imperfective in three tenses, and in addition uses three 'facultative' aspectual particles that combine with the imperfective and characterize phases of the action: the initial phase or inception *mέ*, the internal or 'durative' phase *ndi*, and the final or 'cessative' phase *sì* (Ernst (1991)).

In the most general sense, aspect is concerned with the relationship between situations – states of the world – and time. Aspect is simultaneously lexical and contextual. Contextual aspect is concerned with how the notions of stativity, activity, and change relate to the contextual occasion, a time internal to the reported events from which events are evaluated. The progressive and perfect (in idealized terms) characterize how the situation reported by a predicate relates to the 'now' of a contextual occasion. The progressive asserts that an activity is actually ongoing at the contextual occasion, but at the same time suggests that that activity could easily *not* be going on (that it could have been cancelled or might soon be cancelled); the activity is valid at the 'now' of the contextual occasion, but only in a relatively limited extension of now. As one projects subsequent time intervals in the future, it is increasingly possible that the activity will cease. The perfect implies that the situation under discussion extends further away from now than one might think, stretching into the past over possible times at which the earlier event might have been submerged in further changes. Progressive and perfect, then, in a somewhat mirror-image fashion, comment on how a situation holding at a contextual now relates to contiguous times. A different kind of aspect, perfective (liminal) aspect, evaluates whether situations are bounded at a contextual occasion. Perfective aspect, at the least, indicates a state or activity is bounded with respect to its extension in time; in some languages (Palauan, Russian), the perfective means the state or activity is bounded in terms of *possible* activity. A perfective differentiates the not-now from the now. Perfectives cannot report events in progress at the here-and-now of speech, but present-tense perfectives do exist with specialized meaning in some languages.

The cardinal properties of perfective, perfect, progressive, and iterative are schematized in Table 5.2.

Table 5.2 *Cardinal aspectual operators*

perfect	Situation presented as a state extending back in time from the contextual occasion (commonly the here-and-now of speech) and projected to continue in the future; natural with liminal predicates; serves as the condition for other states or changes around the contextual occasion
progressive	Process ongoing at contextual occasion (commonly the here-and-now of speech) that is projected to continue in the immediate future, but could easily change or cease; natural with process predicates (not states); often in conflict with (or even interrupted by) other situations.
perfective	Situation bounded around contextual occasion (not the here-and-now of speech), after which time no more activity is projected and the resulting state will continue; natural with liminal processes; means inception with stative predicates; sequences the given event with respect to other events.
iterative	State consisting of subevents alternating in polarity over the contextual occasion (often the here-and-now of speech), a pattern that is projected to continue; natural with processes or liminal processes; either the whole state or the individual subevents can interact with other events.

2   Tense

> [T]here are three times, the present of things past, the present of things present, and the present of things future . . . The present of things past is in memory; the present of things present is in intuition; and the present of things future is in expectation (Augustine (1960:XI))

If we are to trust Augustine, the past and the future can only be known and accessed from the present. And so, tense in language starts from the here-and-now of speech and constructs a linkage to a second time – here termed the contextual occasion. One can go to a time earlier than the time of speech, for which the morphological category would be *past* tense (= PST) or *preterite*, or to a *future* time later than the time of speech (= FUT), or one can remain in the neighbourhood of the speech time, the *present* tense (= PRS).

The contextual occasion from which the situation itself is viewed may be localized by means of temporal adverbs. If *John was reading before noon*, the phrase *before noon* establishes an approximate time interval during which the contextual occasion falls, and, as an indirect consequence, it establishes when the activity of reading was in progress. Temporal adverbs can identify relatively punctual times (*at noon*) or intervals; intervals can be closed (*between three and four o'clock*; *in 1934*) or open on one side or the other (*before noon*; *after supper*). Some time adverbs are deictic. Adverbs like *now* or *yesterday* refer typically to the speech event and are explicitly deictic. Often deixis is implicit: *in summer* can easily be read as 'in this summer near the speech time, or, in narrative, as 'in that summer near the contextual occasion'.

Languages differ in the number of tense distinctions they express in morphology. Lithuanian distinguishes three tenses, past *dirbau* 'I worked (was working)', present *dirbu* 'I work (am working)', future *dirbsiu* 'I will work (will be working)'. Many languages make two-way distinctions. Yidiɲ (Dixon (1977)) opposes a past tense to a neutral, nonpast. The past is used both for events in progress at a past time (the first clause of (33)) and past liminal events (the second clause of (33)):

(33) banaː yuŋaːɲ   gaɲaraŋgu bala baḍaːl
      water cross.PST alligator   shin bite.PST
      'he was crossing^{PST} in the water when an alligator bit^{PST} one shin off'

(34) waɲiːra   mayi bugaŋ?
      what.kind fruit eat.NTL
      'what kind of fruit are you eating^{NTL}?'

(35) biriːɲḍa biɻi gunḍiŋ
      sea   back return.NTL
      'I'll return^{NTL} by sea'

The general, or neutral, form is nonpast; it can be used for events actually in progress at the speech time (34) or liminal events that lie in the future (35). Alternatively, a language may oppose future (often more broadly, irrealis) to nonfuture (or realis). In Mapudungun (also known as Auracanian: Andean, Argentina and Chile), an unmarked neutral form of the verb can be understood as referring to either past or present activity; time can be specified with adverbs (36). Future events are marked with an overt affix (37) (Golluscio (2000:246)):

(36) elu -fi-ñ   ko   {wiya   ∼ fewla}
      give-NON-PARTITIVE-IND.1SG water yesterday now
      'I {gave ∼ give}^{NTL} him water {yesterday ∼ now}'

(37) elu-a-fi-ñ   ko
      give-FUT-NON-PARTITIVE-IND.1SG water
      'I will give^{FUT} him water'

Lakhota is similar. 'In simple, declarative sentences present and past are not distinguished' and are not marked by any overt morphology (Boas and Deloria (1941:156)). Future events are expressed by an overt postverbal clitic *kta* ∼ *kte*.

Some languages make no morphological distinctions of tense, on a strict construction of the term. To take one of many possible examples, Polynesian languages like Maori use particles proclitic to the verb to indicate various relations of situations to time and circumstances.[10] The three aspectual particles

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[10] The basic paradigm and glosses (but not the terminology) from Williams (1971:xxxviii). For a more contemporary and elaborated discussion, see W. Bauer (1993:441 for (39), 420 for (41)).

(leaving aside modal particles) are compatible with different times, especially if explicit time adverbials like *inapoo nei* 'last night' or *aapoopoo* 'tomorrow' are used. The progressive, spelled out by two particles, the first proclitic and the second enclitic to the verb, can refer to any time:

(38)   e   karanga ana   ia
         PGR1 call   PGR2 (s)he
         '(s)he was / is / will be calling^{PGR}'

Similarly, the perfect *kua* can refer to the state newly resulting from an event that holds in the past or the present or the future:

(39)   kua karanga ia
         PF   call   (s)he
         '(s)he had called / has called / will have called^{PF}'

The time at which the state holds can be the contextual occasion of the narrative:

(40)   ka   koki   mai a Kupe kua moohio ia   kua mate a Hoturapa
         PFV return here Kupe   PF   know   s(he) PF   dead Hoturapa
         'when Kupe returned^{PFV}, he realized^{PF} that Hoturapa had died^{PF}'

The perfective *ka* is variable in its temporal reference. It can be used to refer to events in the future or in the past:

(41)   ka   karanga is
         PFV call   (s)he
         's(he) called / began to call / will call / will begin to call^{PFV}'

If the contextual occasion is in effect present, *ka* reports a universal, potential action.

(42)   i te koanga   ka   horo te tupu   o te puuhaa
         in.the.spring PFV fast   the.growth the.puha
         'in the spring, the growth of the puha plant [*sonchus oleraceus*]
            is fast^{PFV}'

It has often been observed that the future tense is not concerned just with time; it is modal as well. Any statement about the future is an assessment of modality – of the possibility of an event happening at some time later than the speech time. It frequently happens that the future tense will also be used for events that are less than actual in some other way. That is the case with the 'future' in Lakhota, which is also used to express obligation, since a prediction about the future can easily be understood as an obligation.

There are other aspectual and modal particles, among them the elusive marker *i* which is said to be an 'indefinite past', used, perhaps, to assert facts rather than to place events in narrative sequence (W. Bauer (1993:442, 423, 426)).

The future is the time that is not yet known: 'future things do not yet exist; ...
however, they can be predicted from present things, which already exist and are
seen' (Augustine (1960:xi.18)). The future can only be anticipated, projected.
The future always allows for branching alternatives: at any time there are at
least two futures that are compatible with that situation. Linguistic time has
been branching all along. From every time alternatives are projected in the
future and then curtailed at later times. In this respect there is an asymmetry
between earlier and later.

There is another respect, however, in which the past and future are parallel.
Both can be accessed by speaker and addressee only from the starting point
of the here-and-now. As a consequence, with both the past and future there
is an intervening time interval between the time of speech and the contextual
occasion, and some languages indicate awareness of the intervening interval.
In Takelma, a single realis form 'does duty for the preterite (including the
narrative past), the present, and the immediate future', while the verbal form
that E. Sapir (1922:157) calls the 'future' is said to be 'employed to refer to
future time distinctly set off from the present'. That is, with the Takelma future,
the here-and-now of speech and the future time are separate, disconnected. In
various languages, the past tense suggests that a situation that once held is no
longer actual. In Kayardild (Tangkic, South Wellesley Islands off the north coast
of Australia), what might be termed the past is restricted to situations 'that have
been left off, that are no longer performed, or whose effects haven't persisted'
(N. Evans (1995a:260)):

(43)   dankawalada jani-jarra   kunawunawura
          many.people search-PST children
          'many people searched for^{PST} [but couldn't find] the children'

In Nez Perce the 'recent past' is used for events within a day or so of the
speech time and/or 'to describe an incomplete action' or 'to describe an action
completed and subsequent retention or regaining of the original state' (Aoki
(1970:113)). In these instances the past is used for situations that are discon-
nected from the present. The path from the here-and-now to the past situation
spans an interval in which the situation is not in force: it was incomplete or
cancelled or the results were reversed.

In this way, tense not only locates an event on the time line, as past or future,
but it can attend to the whole history between now and not-now, including
the intervening time. Some languages make distinctions of metrical tense that
measure the length of the time interval between the here-and-now of speech and
the reported situation (Dahl (1984)). In the Wishram-Wasco dialect of Chinook,
four metrical tense distinctions, expressed by prefixes, are made in the past
time: immediate (*i(g)-*), recent (*na(l)-*), far (*ni(g)-*), remote (*ga(l)-*) (Silverstein
(1974)). Often there is symmetry or near-symmetry between past and future.

In Nugunu (Bantu, Central Cameroon), for example, there are three grades of remoteness in both the past and future. These six metrical tenses are opposed to the present tense. The seven tenses can be either perfective or imperfective. Given a frame with a perfective verb such as *a ⎯ dɔ́mbá* (∼ *dɔ́mba*) 'he leave^{PFV}', one of six tense markers can be inserted: three referring to the past – *mba* 'long ago, or at least earlier than the preceding day', *á* 'the preceding day', *báa* 'earlier the same day as the speech event' – and three to the future – *gaá* 'later the same day', *ná* 'tomorrow (more certain)', *ŋga* 'someday later (less certain)' (Orwig (1991):150)). Analogous distinctions are available in the imperfective. ChiBemba (also Bantu) makes four nearly symmetrical distinctions in past and future (Givón (1972)). Metrical tense in Bantu and elsewhere is concerned with the approximate length of the interval that intervenes between the here-and-now of speech and the reported situation. In this way metrical tense demonstrates that tense involves not just locating events in time, but involves constructing a path from the present to the contextual occasion and the event.

In the simplest case, the path of tense leads from the here-and-now of speech to a contextual occasion in the neighbourhood of the reported situation. Matters can become more complicated, however, in various respects.

It was noted above that the perfect locates one situation with respect to a contextual occasion. In particular, perfects in the past and future locate a situation internally, in relation to the contextual occasion; for example, in the past perfect of *shortly before, at three o'clock, his fate had been sealed*, there is a time in the narrative when the person is reflecting on his fate, and the event itself lies further in the past – *shortly before, at three o'clock*. In this sense, past and future perfects could be termed *relative* tense, or *taxis*. Such tenses locate an event as past or future or present in relation to a contextual occasion that itself is located in the past or future. Viewed in this way, the past perfect is a past-in-the-past, the future perfect is a past-in-the-future tense. As noted, these forms allow specific statements of the time when the event occurs, and do not have a strong implicature of result, in both respects unlike the present perfect; their function is less to state continuing relevance than to state relative tense. Occasionally one finds a future-in-the past (English *would* being an example: *Elizabeth Hawthorne would come to feel that life was best lived in eternal pale repose*) or even a future-in-the-future (Comrie (1985)).

When a situation is expressed by a verb that is syntactically subordinated to another, there is commonly some specific indication of how the contextual occasion of the subordinate situation relates to the contextual occasion of the matrix clause. Classical Mongolian has an imperfective converb *-ǰu* that 'expresses an action performed simultaneously with the main action'. Applied to verb roots like *kele-* 'say' and *yabu-* 'go', it yields converbs used for subordinate clauses like *kele-ǰü* 'while saying', *yabu-ǰu* 'while going'. That imperfective converb

is opposed to a perfective converb -*ged* that 'expresses an action completed before the main action starts', as in *kele-ged* 'after saying', *yabu-γad* 'after having gone' (Poppe (1964:96–7)). In Tübatulabal, subordinate verbs distinguish action that is anterior (= ANT (44)) as opposed to simultaneous (= SIM (45)):[11]

(44)   kóːimí   ánaŋ-íːyá'awáŋ   iŋgím   táːtwál
    woman   cry-ANT   came   man
    'when the woman had stopped crying^{ANT}, the man came'

(45)   kóːimí   ánaŋ-áŋ   iŋgím   táːtwál
    woman   cry-SIM1   came   man
    'while the woman was crying^{SIM1}, the man came'

In fact, Tübatulabal distinguishes a second kind of simultaneous action, in which the punctual event of the matrix clause interrupts the subordinate event (46).

(46)   kóːimí   tïka-káŋ   apá'agín   táːtwál
    woman   eat-SIM2   hit   man
    'the man hit the woman when woman was eating^{SIM2} [and as a
    result her eating was interrupted]'

The contrast of two tenses, both expressing simultaneous action, demonstrates that the relationship between situations in time involves more than just location in time.

    Matters can be quite complex in finite clauses. In European languages with well-developed tense systems, it makes a difference how the subordinate clause relates syntactically to the matrix clause. Relative clauses and ordinary temporal clauses with conjunctions ('when', 'until', 'at the same time as') usually look directly to the speech event for their temporal orientation.[12] Thus in *Ramona came in while Beezus was reading*, the ongoing process of reading is past tense because it is prior to the here-and-now of speech, not because it is earlier than the arrival.

    Indirect speech – a context in which the main event is a verb of speech (or analogous to a verb of speech, such as a verb of knowledge, or perception, or belief, and so on) – is a horse of a different, and quite interesting, colour. When the matrix verb is a verb of speech, in this extended sense, there are two layers of speakers and two layers of speech times: the internal speaker (below, Ramona), whose words are reported, and the external speaker, who is responsible for the

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[11] Voegelin (1935a:126–7). The forms cited here are the switch-reference forms, used when the subjects of the matrix clause and the subordinate clause differ.
[12] Complexities examined by (among others) Declerck (1991).

whole report. In situations of layered speech, the external speaker can choose to use *direct speech* and yield the floor totally to the internal speaker: *Ramona had to punish Howie, so she said: 'I am never going to play Brick Factory with you again.'* In this case the pronouns and tense will be those of the internal speaker. Or the speaker can choose not to yield the floor completely but can present the embedded speech in *indirect speech*, with third-person pronouns rather than first- or second-person pronouns: *Ramona had to punish Howie, so she said she was never going to play Brick Factory with him again.* In indirect speech, there are two speakers, the internal speaker whose words are paraphrased, and the external speaker, who absorbs and then reports the words of the internal speaker, and two here-and-nows of speech (see Cohn (1978) on the considerable variation in types of indirect speech). Because there are two layers of speech, there can be some tension over how to locate the reported situation in time. Languages have different preferences.

Russian normally determines tense locally, relative to the time of the *internal* speech event. Suppose, for example, that the external speaker reports that an internal speaker is aware of a situation of 'children playing', and chooses to express that information as a finite embedded clause. If the activity is simultaneous with the act of thinking, a present is used ($igrajut^{PRS}$); if the activity was earlier, a past is used ($igrali^{PST}$); and if the activity of playing will come later – if the internal speaker imagines playing in the future – the periphrastic future is used ($budut\ igrat'^{FUT}$). It does not matter what tense the verb of speech is. The tense of the subordinate verb is determined with respect to the contextual occasion of the matrix verb, regardless of whether the verb of speech is past (47) or present (48) or future (49):

(47)   On dumal,   čto deti   {igrali   ~ igrajut   ~ budut igrat'}
        he think.PST that children   play.PST   play.PRS   play.FUT
        'he thought^{PST} that the children {had been playing^{PST} ~ were
        playing^{PRS} ~ would play^{FUT}}'

(48)   On dumaet,   čto deti   {igrali   ~ igrajut   ~ budut igrat'}
        he think.PRS that children   play.PST   play.PRS   play.FUT
        'he thinks^{PRS} that the children {were playing^{PST} ~ are playing^{PRS}
        ~ will play^{FUT}}'

(49)   On budet dumat', čto deti   {igrali   ~ igrajut   ~ budut igrat'}
        he think.FUT   that children   play.PST   play.PRS   play.FUT
        'he will think^{FUT} that the children {were playing^{PST} ~ are playing^{PRS}
        ~ will play^{FUT}}'

Thus the tense of verbs in Russian in clauses of indirect speech (or thought or imagination) is generally determined relative to the time of the internal speech event.

It is worth mentioning that, under special conditions, another strategy is available in Russian. If the conjunction is *kak* 'how' and the matrix verb reports the observation of a process, either present or past tense is possible in the embedded verb:

(50) On nabljudal, kak deti   {igrali   ~ igrajut}
      he observe.PST how children play.PST play.PRS
      'he observed^{PST} the children playing $\{^{PST} \sim {}^{PRS}\}$'

In this context, using the present tense focusses on the moment of observation, from the point of view of the internal speaker: here is a picture of what the internal speaker observed in and around a certain time. The past pushes the whole occasion into the past: the time of observation and the situation of playing are buried in the past.

English, in the formal register, invokes a strategy reminiscent of the latter strategy of Russian.[13] Consider a context with a matrix verb with a past-tense form, such as *he said that* or *he knew that*. A past tense used in the embedded clause, as in *He said/knew the children were playing*, reports a situation that is simultaneous with the internal event of speech or knowledge; the activity of playing overlaps the event of his speech or state of knowledge. A pluperfect in the embedded clause reports a situation that held prior to the time of the speech/knowledge; in *He said/knew the children had been playing*, playing went on over some time interval before the time of internal speech/knowledge. And a future-in-the-past, as in *He said/knew the children would be playing*, reports an activity that is imagined to occur after the time of the verb of speech/knowledge. The pattern is termed variously *sequence of tenses* (used here), *backshifting*, or *transposition*. Sequencing of tenses happens with matrix verbs that are past in form or are past in reference. Thus sequencing is used with: the pluperfect *had said that* / *had known that . . .*, or *should never have said that* / *should have known . . .* or the counterfactual subjunctive *were he to know/say that . . .*, or a non-finite verb with implicit past reference (*he regrets saying* / *knowing that . . .*), or even a historical present referring to the past (*Occasionally, Darwin admits he had somewhat carelessly spoken of variation*). In contrast, with a matrix verb in the future tense, the time of the embedded situation is normally evaluated relative to the time of internal speech event: *He will learn that the children were playing* – the playing occurred before his learning; *He will learn that the children are playing in the street* – the playing occurs at the time of his learning.

When the sequence of tense is invoked, there is in a sense an extra mark of past tense in comparison to what such sentences would have if they were expressed

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[13] It is not clear how widespread this latter strategy is. Georgian has been cited (Hewitt and Crisp (1986)).

as direct speech.[14] That fact suggests an interpretation (approximately that of Declerck (1991)). Augustine taught us that all tense involves linking from the here-and-now to the contextual occasion. Accordingly, in layered speech, there is a double linkage: from the external speech event to the internal speech event, and from there to the reported event. The extra past tense used in the sequence of tenses marks the intermediate step of the linkage; it marks the fact that, when the external speech event is already past, the internal speech event is past relative to the external speech time. This is the source of the past-tense marking for simultaneous states (*she said she was sick*), of the double past-tense marking of the pluperfect (*he said that she had arrived*), and of the future-in-the-past (*she knew he would arrive*).

The sequence of tense is often avoided in informal English and occasionally in formal English. When sequence of tense is not invoked, the external speaker chooses to determine tense in relation to the time of the internal speech event, in a fashion analogous to the primary strategy of Russian. The world of the external speaker and the internal speaker are not distinguished. One reason for not distinguishing is if the reported situation still holds in the here-and-now of the external speaker (*He said he is available to meet on Tuesdays* – the statement of accessibility held at the time of the internal speech and still holds now). Another reason is if the internal speech reports a universal truth which is viewed the same way by both speakers. For example, a modern biographer, writing of Nathaniel Hawthorne's difficulty in finding time to write his fiction while he was farming in the Utopian community of Brook Farm, states that: *Hawthorne had discovered that farming is not done in a few hours but from sunup to sundown*. What Hawthorne discovered is a general truth, one that both biographer and Hawthorne might express in the same terms. Thus, failing to invoke the sequence of tense blurs the worlds of the two speakers and merges the way they express what they say or know or see.

In contrast, invoking the sequence of tense keeps the times and worlds of the external speaker and the internal speaker apart. Sequence of tense limits the reported situation to the past time-world of the internal speech event. The embedded event can only be accessed through the process of linking and translating from internal speaker to external speaker through the intermediary of the

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[14] The phenomenon of sequence of tense has elicited various interpretations (Smith (1978); papers in Coulmas (1986); papers in Gvozdanović and Janssen (1991); Janssen and van der Wurff (1996)). Comrie (1986a) argues against the view that a sequenced past is an 'absolute' past keyed directly to the here-and-now of speech. Binnick (1991: 82–98, 339–92) details the problems with two of the more popular approaches, those that involve tinkering with the Reichenbachian system and those that derive sequenced tense by rule from the 'true' tense of direct speech. Declerck (1991), who also argues against deriving sequence of tense by rule, views sequence of tense as a linking between the reported situation and the here-and-now (external) speech time *through* the intermediary of the internal speech event, which motivates the extra past tense marking.

internal speech event. In *Hawthorne had also discovered that he could (*can) not let his friends break their backs over a heap of manure without him*, there are two steps: from the biographer and her readers to the past world of Hawthorne and, within the past world generally, to Hawthorne's individual reaction to his experiences on Brook Farm. What Hawthorne discovered was something about *his* role at Brook Farm; it was a fact bound to that specific time and world, not a general truth. Hence the biographer uses the past-tense *could* (reflecting sequencing) rather than present-tense *can*.

The contrast of sequenced tense with unsequenced tense does not mirror directly what is actually true in the present, or what the external speaker believes to be true. For example, a contemporary history of biology uses an embedded present in telling us that *Breeders and naturalists believed until well into the first quarter of the twentieth century that there are two kinds of variation*. That is a proposition the author, a modern biologist, does not subscribe to, but it is a proposition that would be *formulated* in the same way by those benighted breeders and by any contemporary enlightened biologist. Within a page the same history tells us that *Darwin found that no two individuals were entirely identical when examined carefully*. That is proposition to which the author does subscribe. Using the past embeds Darwin's discovery in the time of Darwin's life and the sequence of his discoveries; the event of the discovery is presented as a fact of Darwin's time.

Thus, tense in clauses reporting the content of speech (knowledge, belief, observation, etc.) can be marked in either of two ways: either in relation to the internal speech event, if the content of speech (or knowledge, belief, etc.) would be stated in the same terms by external and internal speaker, or, alternatively, by linkage from the internal speech event in the past to the external speech event, if the act of speech (or knowledge or belief) and the content are limited to the past time-world. Russian and English differ markedly in which strategy they prefer for marking tense in indirect speech.[15]

In languages that have an unambiguous past tense, sequential narrative is usually carried out in the past. But when the time at which an episode occurred has been established as past, the speaker can choose to take for granted the linkage from the here-and-now of speech to the contextual occasion in the past and instead carry on the narrative in the present tense, using the device of the *historical present*. The speaker pretends to be present and to witness the events without any temporal distance, thereby presenting events as immediate or vivid.

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[15] Attic Greek used a distinction of two moods, indicative and optative, in indirect speech in a similar fashion. Goodwin comments (1880:152): 'the Optative [is] used when the writer wishes to incorporate the quotation *entirely* into his own sentence, and the Indicative, when he wishes to quote it in the original words as far as the construction of his own sentence allows'. That is, the optative marks the process of translation, and the indicative yields the floor to the internal speaker, eliminating the distinction of two speakers.

To an extent, the question of when the speaker chooses to invoke the historical present, and for how long is a matter of style and individual preference. Still, the shift to historical present tends to occur in describing events that are boundaries in some other respect, such as shifts of location or shift from narrative to reported speech. For example (Wolfson (1982:43)), the following episode begins with past tenses: *I was at the shopping center the other day so I met, I met Gary there . . .* The speaker then switches to the present to report Gary's challenge, which is the pivotal event of the beginning of the narrative: *and he says, 'Come on down, I want to play some pool with you.'* The speaker switches back to the past tense to report the speaker's predictable response to Gary's challenge (*So I said 'All right'*) and to provide a background explanation (*I hadn't been down there for years and you know, played pool*). After this aside, the speaker uses the present to narrate the transition to the contest itself (*So we go down . . .*) and continues to use the present to describe the drama of the competition as one could observe it if one were there in the pool hall with the narrator: *. . . and he takes this stick out of the case and puts it together and he goes through all the motions like these big pool hustlers*.

The 'historical present' – in the sense of this transposition of narrative perspective to the present – can be used in a wide range of genres or contexts: oral narrative, history, epic, reportage (Fleischman (1990)). The device is employed with different frequency and stylistic connotations in different genres and traditions (Fleischman 1991). In English the device is in fact sometimes used in historical writing to report on timeless individuals whose activities are observable as if in the present (*Occasionally, Darwin admits he had somewhat carelessly spoken of variation* – as can be observed now in his writings), whereas the past tense treats individuals as bound to their historical time (*Darwin did not believe in 'spontaneous variation'* – a judgement about his beliefs at a past time). On the whole, however, in English, using the present to narrate the past has strong connotations of orality. The device appears to be used more freely in Russian (for example, in writing about history), with less extreme stylistic connotations.

The diachronic paths of development of tense are now familiar (Bybee and Dahl (1989); Bybee *et al.* (1994)). If an event is known to be completed (perfective) or to result in a state (perfect), it is an event that, as a rule, has occurred in the past. Hence past tense develops from aspectual markings, from perfectives or perfects. Future tenses develop from certain specific verbs (Palmer (1986:216–18); Bybee and Dahl (1989)): verbs with the modal content of intention and volition (English *will*, Serbian *hoću* 'I want' > *ću* 'I'll'), modality of obligation (Latin to Romance futures using forms of *habēre* 'to have'), or aspectual content of movement and change (English *going to* > *gonna*). Whatever an agent intends to do or feels obligated to do or moves in order to do is something that is not yet a reality, but it is something that the agent desires or feels obligated or moves to bring about. These verbs all project a transition from non-existence of

Table 5.3 *Cardinal temporal operators*

present	Situation holds over an interval including the moment of speech, and potentially the immediately preceding and the immediately following time; situation can be known directly and coexists with other situations; natural with states and activities but not liminal predicates
past	Situation holds over an interval prior to the here-and-now of speech, and by implicature no longer at the here-and-now of speech; situation is known with certainty and is assumed to be responsible for the here-and-now; most natural with liminal predicates
future	Situation holds over an interval later than the here-and-now of speech, and (ordinarily) not yet at the here-and-now of speech; the situation can only be projected and anticipated from the here-and-now; natural with liminal predicates
distal / remote / metrical	Situation holds at a time that is separated from the here-and-now by some (long or measured) interval of time in which the world is qualitatively different from the here-and-now

a situation to existence of a situation in the future, and can easily be generalized to future situations generally.

A schematic summary of the basic tense operators (present, past, future) is given in table 5.3.

Both tense and aspect have to do with situations in time, and both are in a sense deictic. Conceivably we should think of the two together as a general category of tense–aspect, or temporality. On that view, aspect locates events (and measures their progress or change or results or liminality) in relation to an internal time – that is, a contextual occasion in the vicinity of the event itself. Tense locates an event with respect to the here-and-now of speech by tracing out a path from the now of speech to the contextual occasion. In some contexts (for example, indirect speech), the path can be complex.

3   Mood and modality

> The real is composed of the potential and actual *together*.
> (C. S. Peirce, qtd in Matthiessen (1947:138))

Modality is about alternatives – how we come to know and speak about the world, how the world came to be as it is, whether it might be other than it is, what needs to be done to the world to make it what we want. The alternatives are sorted out and evaluated by some sort of authority, often the speaker, or, if not the speaker, some other participant or even another situation. Modality, then, is consideration of alternative realities mediated by an authority.

When, for example, the narrator says to his addressees *Call me Ishmael*, he hints at two alternative histories. First, he indicates that his addressees do not yet call him by that name and, if he did not intervene with his request, his addressees would continue not to call him by that name. That is one of the versions of reality, one history: '¬σ until now, expect ¬σ to continue'. (Here 'σ' is a situation, '¬σ' its negative counterpart.[16]) Second, against the background of this history, which should continue by inertia, the narrator proposes to have us substitute an alternative history and change the future. The narrator in effect says, true, you have had no reason to call me Ishmael up to this time – that is, '¬σ until now' – but please, by all means, call me Ishmael – 'from this point forward, let there be σ instead of the inertial ¬σ'. In doing this, the speaker acts as an authority – as someone or something that can juxtapose and evaluate alternative versions of reality and influence the relationship between them. Further, the speaker attempts to persuade (invite, obligate, cajole) the addressee to act as a secondary authority who will then take responsibility for influencing the relationship between two alternative histories.

Although the imperative is an extreme form of modality, the same elements – alternative histories, mediation by an authority – can be found everywhere, if only in weaker or degenerate form. The ideas of authority and alternatives are present even in seemingly innocuous assertions in the indicative (realis) mood. Consider, for instance, Darwin's report of sighting whales – 'monsters', as he calls them – off the coast of Tierra del Fuego: *On one occasion I saw two of these monsters, probably male and female, slowly swimming one after the other, within less than a stone's throw of the shore*. Even such an indisputable assertion engages in weighing two alternative versions of reality. Darwin in effect is saying to his addressee, 'you might expect ¬σ – that whales would *not* come close to the shore – but no, I wish to inform you that the truth is rather σ – whales can be seen close to shore (and your expectation is thoroughly misplaced, for they come even as close as a mere stone's throw!)'. Even an assertion, then, weighs two histories: the asserted reality and the alternative, still imaginable even as the speaker excludes it.

There are many, many ways in which a situation can be less than certain and real, and hence many flavours of modality are active in language. Perhaps three realms of modality can be distinguished: epistemology, obligation, and contingency.

The first realm of modality, *epistemology*, has to do with knowledge about events and the world. We are perhaps accustomed to thinking of the person who speaks as an unquestioned authority, as the source of the knowledge or beliefs that the speaker puts forth. But the role of the speaker is more complicated.

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[16] In a sense, negation is a pure operator of modality – of alternatives – so much so that it merits its own treatment: see J. R. Payne (1985).

The speaker has a dual role, of being the addressee of sources of information (sensory perception, the speech of another speaker) and then turning around and acting as speaker. Although language often ignores the speaker's activity in acquiring knowledge, devices in language sometimes point to the existence of such a process of epistemology. Questions are the most explicit operator in the realm of epistemology. In a question, after all, the speaker concedes lack of complete authority and asks the addressee to act as an authority and correct the deficit. Interrogatives are a very special linguistic operation (or set of operations), which merit a discussion of their own (see chapter I.5). At the opposite end of the epistemological spectrum from questions are declarative indicative sentences. As we just observed, even a confident assertion of one's knowledge – like Darwin's assertion about the monsters swimming close to shore – has some degree of epistemological modality.

In between the epistemological uncertainty of questions and the near certainty of assertions, the speaker can indicate some attention to epistemology, or what is often termed evidentiality: that is, some concern with how knowledge is acquired and how certain it is.[17] For example, Takelma (Oregon, isolate?) can discuss the death of a man at the hands of a bear by using the stem of the realis mood (51) or by using the 'inferential' suffix with a different form of the verbal stem (52):

(51)   menà yapʼa tˁomō-kʼwa
            bear   man   kill.RLS-3OBJ
            'the bear killed the man'

(52)   menà yapʼa dõm-kˁwa-kˁ
            bear   man   kill-3OBJ-INFR
            'it seems that the bear killed the man (the bear must have / evidently
            has / killed the man)'

The inferential is used 'to imply that it is definitely not known from unmistakable evidence that the event really took place, or that it is inferred from certain facts (such as the finding of the man's corpse or the presence of a bear's footprints in the neighborhood of the house), or that the statement is not made on the [speaker's] own authority' (Sapir (1922:158)). Sapir's characterization is instructive, for it brings out the notion of authority of knowledge. The inferential construction exactly indicates that the speaker's authority is attenuated, uncertain.

Within the general realm of epistemological modality, a frequent concern is to mark that the information being reported by the primary speaker has been acquired through the speech of another speaker. In Tübatulabal, for example,

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[17] Cross-linguistic investigations of evidentiality can be found in Chafe and Nichols (1986).

a sentential clitic is used in any clause reporting information learned from the speech of others. The use of this *quotative* particle was so regular, even in myths, that it prompted C. F. Voegelin (1935b:v) to comment: 'Because it has been suggested that the much repeated quotative, translated "it is said" in the myths, might weary the folklorist who reads for meaning, the quotative is consistently left out of all translations except that of the first myth.'

Speech is not the only means of acquiring knowledge. In Tuyuca (South America), any of five (third-person masculine singular) suffixes can be added to the verb *apé-* 'play' in a frame *díiga apé-* 'play soccer' (Barnes (1984), quoted in Palmer (1986:67)). The markers discriminate different ways in which the speaker has acquired the information reported: *-wi*, 'by visual observation'; *-ti*, 'by non-visual observation'; *-yi*, 'by interpretation of evidence'; *-yig*, 'by quotation from another speaker'; *-hy*, 'by inference'.

Certain syntactic constructions invite one to think that knowledge is inferred, evidential, incomplete, uncertain. Perfects report that a result has been achieved in some entity or in the world at large. Accordingly, from the result the event itself is inferred. Perfects, then, often have the overtone of evidentiality. Passives often have evidential colouring, for the same reason: they often report a resulting state in some entity. An extreme example is the passive in Lithuanian, especially when it is formed from an intransitive. (The resulting passive is impersonal: the participle is neuter singular, and the 'agent' can be expressed overtly.)

(53)

jo	čia	šokta		per	griovį
3SG.MSC.GEN	here	jump.PASSIVE.PARTICIPLE.NTR.SG		over	ditch

'by him there has been jumping over the ditch'

Example (53) could be used, for example, if the speaker sees footprints or trampled grass inviting the inference that jumping has occurred.

Indirect speech is another explicit way of indicating that knowledge is derivative. In English, indirect speech is marked by sequence of tense (a past tense when the matrix verb is past, as discussed above). In Greek, indirect speech is marked by the optative. Similarly, in German, the non-indicative mood (*conjunctive*) is often used in quotation. In both, the very uncertainty of the knowledge leads the sentence to be marked by an irrealis grammatical mood.

Epistemology is then one realm of modality. A second realm of modality could be termed *directive* or *jussive* or 'so-be-it' modality (*jussive* from Latin *jubēre* 'command'), in which the responsibility for the state of the world is transferred from one authority to another. The imperative, as discussed above, is the most extreme and overt form of jussive modality. Many other modalities can be viewed as weakened or indirect imperatives.

A demand or wish for a change can be an invitation to the addressee to share in the burden of changing the world, as in *Let us go then, you and I* (*hortative*).

Or the speaker may express a wish (*optative*) that the world be changed from its current or likely state. In using the optative, the speaker does not impose responsibility for the change on the addressee, but rather states a wish that the world will change spontaneously: *And God said, 'Let there be light', and there was light*.

Languages often have a class of verbs which, in their lexical meaning, report the fact that a command is being imposed. The class of *directives* includes verbs meaning 'order', 'permit', 'prohibit', 'persuade', 'dissuade', or potentially almost any verb of speech used to report not a fact or an intelligence but the attempt to impose an obligation to change the world ('tell John to leave', 'wave to John to come closer'). The verb itself, since it reports a fact, could easily be in the realis mood, but the content of what it reports is analogous to an imperative; whatever is ordered is not yet actual. Hence the clause embedded under a directive verb is often not an ordinary finite realis verb, but an infinitive or irrealis mood. The grammatical subject of the directive verb is an internal speaker, corresponding to the speaker of an imperative. The object of a directive verb – the person receiving orders – is analogous to the addressee of an imperative, who is instructed by the primary authority to act as a secondary authority to change the world.

Volitive verbs (*I want*, *I will*) are directives turned back on the self – the same person who acts as primary speaker ('I have a wish about the world') also takes responsibility for the world ('and I will act accordingly'). *Purpose* (*final*) clauses combine intentional (self-directed) modality and also contingency. Doing something in order to achieve a result presumes a discrepancy between the current reality and the future reality anticipated when the result of the final situation is achieved. The new situation follows only under the condition that some event is fulfilled. For example, if *Jack and Jill went up the hill / To fetch a pail of water*, the final event of fetching is dependent on the going, and the going is in the hands of the authorities, Jack and Jill.

Just as directives are factual reports of imperatives, there are verbs akin to optatives – predicates expressing the speaker's wishes or apprehensions, such as 'resent', 'regret', 'appreciate the fact that', 'fear', 'hope', 'be distressed to hear that'. Such verbs tend to be stative, and they have a prominent argument which is often less than a full-fledged grammatical subject. That argument names an internal speaker or authority: whoever fears a situation is an authority evaluating and responding to alternative scenarios, in a fashion analogous to the external speaker who expresses the wish of an optative. The situation reported by such verbs involves a tension between two alternative histories. The two histories differ in character depending on the predicate. *Regret* or *fear* presuppose the likelihood of the situation ('I acknowledge that σ could be real') while it expresses a counterfactual hope for the opposite polarity ('. . . but wish instead that ¬σ'). A predicate such as *be relieved* presupposes a certain situation, but

acknowledges that the world might have been otherwise, at the present or in the future, again with a hope for the opposite ('I was afraid that ¬σ, but it turns out instead, happily, that σ'). Such *evaluative* (or *attitudinal*) predicates are reports of facts, and while the predicates themselves appear in the realis mood, the content of the wish or the fear or the anxiety is not completely actual. That often calls for a mood other than the indicative (realis).

Obligation is a kind of directive modality. The modality of obligation – often termed *deontic* modality, from the Greek participle *deon* 'that which is bound, tied' – involves both authority and alternative realities: *'Well, you may fall in love with whomsoever you please, but you mustn't fall in love with my niece', said the old man*. Behind obligation is an operation analogous to an imperative or optative: 'creating an obligation should be understood . . . in terms of authoritative acts of "so be it"' (Lyons (1977:835)). Lyons's compact formulation points to ways in which the general notion of obligation is analogous to an imperative. In the imperative, the speaker precipitously declares 'so-be-it'; the obligation comes out of the blue and is imposed on the addressee. In lexical verbs that express obligation – verbs such as *ought*, *must*, *should*, *behoove* – the obligation is normally a static obligation, always applicable when a relevant occasion arises. And although there is no explicit, individual speaker to declare 'so-be-it', the sense of a source – of an authority – is still there. The actual speaker, instead of imposing the 'so-be-it', speaks on behalf of a higher speaker or, it might be better to say, on behalf of all speakers. Authority becomes impersonal, generalized. The 'so-be-it' character of obligation points to the tension between two alternative histories: left to its own devices, the addressee of obligation would be inclined to allow ¬σ, at least in some worlds, but the speaker, invoking general principles, reminds the addressee that σ holds in all worlds. Thus deontic modality, or obligation, involves both transfer of responsibility from one authority to another and alternative histories.

Related to obligation is permission (English *may*, now *can*). Permission, like obligation, involves an implicit, generalized authority, and responsibility for action is granted to a proxy authority. Permission likewise has two histories: one might imagine, by inertia, that ¬σ in all worlds, but instead, let there be one accessible world in which σ holds. Closely related to permission is *ability*. In the modality of ability, there is merger of two roles: whether or not the agent can bring about the situation σ depends on properties of that same individual. School teachers a generation or two ago used to warn pupils to differentiate *can* and *may*, reserving *can* for ability, *may* for permission; the fact that we were so warned indicates that permission (*may*) is not far removed from possibility (*can*).

With permission and obligation, the primary authority becomes impersonal, but there is still an addressee of the obligation, someone who is charged

with bringing about the 'so-be-it'. If the addressee of obligation also becomes impersonal – if the responsibility for 'so-be-it' is taken away from any individual and ascribed to the world, then permission and obligation shift to characterizing the possibility or necessity of some situation in the abstract. Thus *'Perhaps it's Mrs Touchett's niece – the independent young lady', Lord Warburton suggested. 'I think she must be, from the way she handles the dog'* does not characterize an obligation on any individual (unlike *must* in *you mustn't fall in love with my niece*), but *epistemic modality*, the degree of certainty of the event as a whole. Epistemic modality makes use of modal concepts seen elsewhere. The necessity or possibility of a whole event is like deontic necessity or possibility, and it is not uncommon for predicates to do double duty and express both deontic and epistemic modality (as does English *must*). Epistemic modality differs from deontic modality in the nature of authority: instead of the generalized authority (of a moral code, of all speakers) in deontic modality, in epistemic modality the authority is the state of the world at the time and the nature of the evidence available to the speaker; that sense of authority was evident in Lord Warburton's *I think she must be, from the way* . . . Epistemic modality shades into epistemology.[18]

The second realm of modality, then, involves a broad spectrum of 'so-be-its': an authority, whether individual or universal, declares that an addressee should effect a state in the world; the desired state – the 'so-be-it' world – is a future world different from the world seen now or from the expected range of possibilities.

The third realm of modality is modality of causation and contingency.

One could think of contingency as the most degenerate form of modality. There is no individual speaker, or even generalized speaker or moral code, who has authority over the world. Responsibility for one situation in the world is assigned to another situation. Contingency is modality reduced to its least individual, and the notion of 'authority' becomes its most metaphorical: one situation is responsible for the existence of another situation.

The explicit form of the modality of contingency is the conditional construction (Palmer (1986:188–99)). Explicit conditionals distinguish two situations: the contingency (Greek *protasis*) and the consequence (Greek *apodosis*). Because defining causation and contingency is notoriously daunting,[19] it may be sufficient to note simply that a conditional construction asserts that one

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[18] Lyons (1977:793) draws the following distinction: 'whereas epistemology is concerned with the nature and source of knowledge, epistemic logic deals with the logical structure of statements which assert or imply that a particular proposition, or a set of propositions, is known or believed'. For linguistic purposes, perhaps 'epistemology' would do as a term covering all considerations of how speakers acquire and manipulate knowledge.

[19] Discussed in various papers in Traugott *et al.* (1986), Jackson (1991).

situation – the contingency, or σ_i – is in some sense 'prior to', or is the authority for, the consequence, or σ_j. Further, the inference is invited in folk reasoning that if the contingency σ_i were removed, then the consequent situation σ_j would disappear as well. Contingency opposes two alternative histories: 'entertain the thought that σ_i is true in a world and then so is σ_j, but if it were to happen the σ_i were not true, one should expect $\neg\sigma_j$'.

Conditionals vary along many axes and come in many flavours. Languages vary in the extent to which they mark conditional structures at all: no marking (Chinese) or marking by conjunctions (Classical Arabic), or marking by combinations of tense or mood, or marking by conjunctions and particles of various etymologies (Ferguson, ter Meeules, Reilly, and Traugott (1986); Comrie (1986b)). Conditional constructions presume that the condition is in some way tentative, uncertain, hypothetical; after all, 'the Greek has no form implying that a condition *is* or *was* fulfilled, and it is hardly conceivable that any language should find such a form necessary or useful' (Goodwin (1965 [1889]:140)). (Arguably, realis past narrative is simply a record of conditions and consequences that *are* fulfilled – but narrative does not require an explicit conditional construction.) There seem to be three ways in which a contingency can be less than certain, and hence three cardinal patterns of explicit conditional constructions.[20] Each has a characteristic, though not exclusive, time orientation that is associated with it. (i) In *general*, or iterative, conditionals, one situation is known to occur off and on, and when it does, we expect the consequent situation to occur as well ('if it happens that σ_i, expect σ_j, but otherwise expect $\neg\sigma_j$'). Example: *Whenever it is a damp, drizzly November in my soul, I account it high time to get to sea as soon as I can.* General conditions are states that are often assumed to be universally valid, hence they have an affinity with the present, but they can also be displaced to the past or future. (ii) In *counterfactual* conditions, the condition is known to be not actual, yet it is considered worth discussing as an alternative reality: 'it is a fact that $\neg\sigma_i$ and therefore (most probably) it is also true that $\neg\sigma_j$, but let us think of a world in which σ_i is rather true, and in that world we would expect σ_j'. An example is: *Had we but world enough, and time / This coyness, lady, were no crime* – because in fact we do not have infinite world and time, your hesitations *are* a crime, says the lyrical persona of the poet Andrew Marvell to the object of his affections. The past is the time that is known with the greatest certainty, and, accordingly, counterfactuals are at home in the past. It is common for languages to correlate past tense and counterfactual modality. (iii) Potential conditions are those whose fate is uncertain: 'it may well be that $\neg\sigma_i$ will come to pass, in which case expect $\neg\sigma_j$, but if

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[20] Greenberg (1986) works with a richer matrix of nine cells – three tenses (of the protasis) multiplied by three degrees of hypotheticality.

by chance σ$_i$ arises, then expect σ$_j$'. Example: *If you will worship me, it shall all be yours* – the devil still hopes his temptation will be efficacious. Potential conditions have a strong affinity with the future.[21]

Languages differ in how they encode the three cardinal possibilities.

Russian tends toward using the same verb forms in both clauses. General (iterative) conditions are marked by imperfective aspect in both clauses. Counterfactuals use the subjunctive mood in both clauses, and potential conditionals use (typically) some sort of future form, either the periphrastic imperfective future or the perfective.

Takelma prefers to mark 'general conditions that apply to past time, or that have application without reference to time-limit' with realis mood in both protasis and apodosis, both 'verbs being, if possible, frequentative or continuative'.[22] That is, aspect is used to mark general conditions. In the two other cardinal patterns, the protasis adopts the same less-than-realis mood, the *conditional* (= CND) (both (54) and (55)). The mood of the apodosis indicates the degree of uncertainty. The *potential* mood (= PNT) is used in counterfactuals (54), the future in potential conditions (55).

(54)   gi ge   yú-k'i? eit'e? bõ   yaná-?   hagà
         I   there be-CND 1SG   then go-3SG.PNT thus
         'If I had been there, then in that event he would have gone'

(55)   ãk' yanà-k'i? gi hono? yaná-t'ē
         he go-CND   I too   go-1SG.FUT
         'if he goes, I too will go'

With respect to the marking of condition and apodosis, Chamorro seems in one respect the opposite of Takelma. Chamorro uses the realis mood in the protasis but the irrealis in the apodosis, in both counterfactual and potential conditions; that difference is marked only by an additional particle *mohon* 'as if' in the counterfactual. Realis mood, sometimes with the marked reduplicated aspect, is used in general conditions.

Usage in Attic Greek is mind-numbingly complex (Goodwin (1880:90–1)). The basic cases are these. General conditions, in the past, take optative in the protasis plus imperfect in the apodosis (56) or, in the present time, the subjunctive in the protasis plus present in the apodosis (57):

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[21] The list of cardinal patterns does not include epistemic conditions, where the uncertainty is in the speaker's knowledge about events: *if Jack fetched the water, [you can be sure that] Jill was pleased*. Epistemic conditionals seem not to elicit distinct combinations of moods, but are parasitic on other conditional structures.

[22] Sapir (1922:esp. 197–8; transcription modified slightly). Most 'tense-moods' are indicated by subtle differences in subject inflection. The conditional is periphrastic.

(56)   ei tis   touto prassoi kalōs eikhen
         if one this   do.OPT good hold.IF
         'if/when anyone did^{OPT} this, it was^{IF} good'

(57)   ean tis   touto prassēi kalōs ekhei
         if   one this   do.SBJ good hold.PRS
         'if/when anyone does^{SBJ} this, it is^{PRS} good'

In potential conditions, the condition is subjunctive and the apodosis is future (58):

(58)   ean prassēi touto kalōs heksei
         if   do.SBJ this   good hold.FUT
         'if he does^{SBJ} this, it will be^{FUT} good'

A familiar complication is that, if the condition is viewed 'less distinctly and vividly', the future is used in the condition as well as in the apodosis (59).

(59)   ean praksei touto kalōs heksei
         if   do.FUT this   good hold.FUT
         'if he does^{FUT} this, it will be^{FUT} good'

In both general and potential conditions, then, the protasis expresses some degree of uncertainty by means of a less-than-realis mood (optative, subjunctive, future), while the apodosis simply uses the indicative in the appropriate tense: past for past general conditions, present for present general conditions, and future for potential conditions.

Counterfactual conditions would ordinarily seem to be the height of uncertainty – after all, the situation is just hypothetical; though it can be imagined, it is known not to be real. Yet counterfactual conditions in Greek use the realis mood, commonly the aorist, in both the condition and the apodosis. The counterfactual character of the condition is marked only by the particle *an* in the apodosis:

(60)   ei eprakse kalōs touto an eskhen
         if do.AOR good this   hold.AOR
         'if he had done^{AOR} this, it would have been^{AOR} good'

In Palauan, general conditions seem not to be distinct from temporal ('whenever') constructions (Josephs (1975)). Other conditions have points of similarity with Greek and Takelma. The protasis is expressed in the same irrealis mood in both counterfactual and potential conditionals – in this respect like Takelma – and the apodosis in the realis – in this respect like Greek. The difference in the degree of uncertainty is indicated by tense of the apodosis: the nonpast, or *neutral*, tense is used for potential conditionals (61) and the past tense for counterfactuals (62).

(61)

a	lę-bęskak	a udoud	a dęmak	e	ak mo	ęr a Guam
if	3SG.IRR-give.NTL	money	father	then	I go.RLS.NTL	to.Guam

'if father would give$^{IRR.NTL}$ me money, I would go$^{RLS.NTL}$ to Guam'

(62)

a	lę-bilskak	a udoud	a dęmak	e	ak mlo	ęr a Guam
if	3SG.IRR-give.PST	money	father	then	I go.RLS.PST	to_Guam

'if father had given$^{IRR.PST}$ me money, I would have gone$^{RLS.PST}$ to Guam'

Kayardild (N. Evans (1995a:ch. 7)), which has an extremely rich system of marking moods, consistently differentiates the protasis from the apodosis. The protasis of counterfactuals uses what is termed 'past', a category which implies cancellation of the past reality; in this way it is compatible with situations known not to be true. In counterfactuals, the apodosis has the most general irrealis mood, the potential:

(63)

ngada	kurr-jarra	bukajina	diinkina	ngada	raa-ju
I	see-PST	seahawk	sit	I	spear-PNT

'if I'd have seen^{PST} a sea-hawk landing, I'd have speared^{PNT} it'

Potential conditions use the conditional in the protasis, the conditional being a distinct mood that appears in subordinate clauses exactly to 'express a state or action that precedes another action' (N. Evans 1995a:261). The apodosis has a mood oriented to the future, such as the potential.

(64)

ngada	yakuringarrba	ra-yarrb	ngada	wuu-ju	ngumbanju
I	fish	spear-CND	I	givePNT	you

'if I spear^{CND} a fish, I'll give^{PNT} it to you'

Iterative conditions likewise use the conditional in the protasis, but use the realis mood in the apodosis, as in (65), which is to be construed iteratively as men stealing sandbanks on more than one occasion.

(65)

jathaa	dangkaa	ngakankinaba	wungi-jarrb	dulmarra	dangkaa	juliya	barrki-j
other	man	sandbank	steal-CND	country	man	bone	chop-RLS

'when another man stole^{CND} (someone's) sandbank, then the boss of that country chopped^{RLS} bones'

Three observations can be made about this considerable variation among languages. First, general conditions are often treated as aspectual and expressed in the same way as iterative events. Second, in the relations between protasis and apodosis, there can be harmony of mood and tense between the clauses (Russian), but more often the condition and consequence are marked differently. Usually it is the protasis that receives some special mark of its uncertain

status (Palauan, Takelma, Kayardild, Greek – except in counterfactuals). But not always: in Chamorro it is the apodosis that is marked as irrealis (also Greek counterfactuals). Third, counterfactuals are usually distinguished from other conditions, but the marking they use is not necessarily less actual than in the potential or general types – which, after all, are also not completely actual. Past tense is often used to mark counterfactuals (Greek, Palauan, Kayardild).

Despite the richness and broad range of notions of modality, it is possible that grammatical systems of mood – modality crystallized as morphology – are relatively simple. A distinction of at least imperative as opposed to realis, or indicative, mood is nearly universal. Curiously, the imperative, though it is semantically extremely rich and in that sense 'marked', is not uncommonly the barest stem form of a verb. It might also be mentioned that the infinitive used to be considered a grammatical mood opposed to the indicative and marked moods (imperative, subjunctive). Indeed, the infinitive is used in many of the same syntactic contexts as subjunctives (or similar ones), subordinated to intentional verbs or directives: *he told me to go* ∼ *that I should go*.

After the unmarked mood – indicative or realis – and the imperative, it is not uncommon to distinguish another mood. It tends not to be used for any single realm of modality, but is an all-purpose mood used to express a range of less-than-completely real modality when the degree of irreality rises to some threshold. There is no single accepted name; traditions differ, and usage differs in different languages. The term *subjunctive* points to the fact this mood will commonly appear in embedded structures. *Conditional* points to one major function of marked modality, that of indicating contingency in explicit conditional structures. *Potential* covers a broad range of especially future possibilities. When there is no established term in some tradition, *irrealis* is useful.

This other mood – an irrealis mood distinct from the imperative and the indicative – will commonly be used in a range of contexts that in one way or another attenuate the certainty of the reported situation. The Spanish subjunctive, for example, is used in a broad range of contexts, including embedded clauses.[23] Setting aside its use in independent clauses, relative clauses, final clauses, and conditions, we can observe that this mood is used in complements of the following five verb types.

(i) Volitive or optative verbs (*querer* 'want', *desear* 'desire') or directives (*permitir* 'permit', *rogar* 'beg, plead', *prohibir* 'prohibit'). Such verbs imply a discrepancy between the current history, in which the situation does not hold

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[23] Examples from Bello (1972: sections 452–7); Díaz-Valenzuela (1942); Borrego and Asencio (1986:33–7, 83–103). The exposition here follows Bolinger (1974) in distinguishing between verbs that 'convey "intelligence"', which have only one polarity, as opposed to verbs portraying an 'attitudinal stance', which entertain both polarities (see also Palmer (1986:140–6, 178, 219)).

($\neg\sigma$), and an alternative history under the authority of the internal speaker, in which the situation (σ) should positively come to hold:

(66)
{Deseo $\sim$ Permito $\sim$ Te   prohibo} que {*estudias $\sim$ estudies} el derecho
I.want   I.permit   to.you I.forbid   that   study.IND   study.SBJ the.law
'I {want $\sim$ permit $\sim$ forbid you} that you study$^{\{*IND \sim SBJ\}}$ law'

   (ii) Deontic predicates:

(67)   Es necesario que yo {*voy $\sim$ vaya} a casa
          be necessary that I   go.IND   go.SBJ *home*
          'It's necessary that I go$^{*IND \sim SBJ}$ home'

   (iii) Evaluative predicates, which imply that the reaction of the internal authority would be different if the situation had the opposite polarity:

(68)   Me quejo de que mi hijo {estudia $\sim$ estudie} poco
          me.trouble that   my.child study.IND   study.SBJ little
          'I am concerned that my child studies$^{\{IND \sim SBJ\}}$ little'

Here the indicative refers to a fact (that the child studies little), the subjunctive a possibility or potential studying (were it to happen that the child studied little).
   (iv) Verbs of denial – certain verbs of mental activity (*dudar* 'doubt' and *negar* 'deny') that report that a secondary speaker is inclined not to believe the positive polarity, while still acknowledging that the opposite might hold:

(69)   Dudo   que {*continúan $\sim$ continúen}   las negociaciones
          I.doubt that   continue.IND   continue.SBJ the.negotiations
          'I doubt that the negotiations are continuing$^{\{*IND \sim SBJ\}}$'

   (v) At the opposite extreme, the subjunctive is not used in complements of positive verbs of speech (knowledge, belief, etc.):

(70)   Sé   que tus   intereses {prosperan $\sim$ *prosperen}
          I.know that your affairs   prosper.IND   prosper.SBJ
          'I know that your affairs are prospering$^{\{IND \sim *SBJ\}}$'

When negated, however, verbs of this type become like verbs of doubt and allow the subjunctive (71) as well as the indicative:

(71)   Lucas no cree   que {existen $\sim$ existan} los extraterrestres
          Lucas not believe that   exist.IND   exist.SBJ aliens
          'Lucas doesn't believe that aliens exist$^{\{IND \sim SBJ\}}$'

Negating a verb of speech opens up the options, allowing both positive and negative polarities of the situation to be entertained, and the subjunctive is usual, though not obligatory. When both moods are possible with negated matrix verbs

such as *no creer* (71), the indicative presents the negative reaction of an internal authority to a certain situation σ (here, the existence of aliens) without paying attention to an alternative: 'given σ, L. rejects belief in σ' or 'L. believes ¬σ'. The subjunctive means that the internal speaker 'doubts' – that is, entertains alternative polarities of σ: 'L. suspects ¬σ while he allows that σ is conceivable'.

The Spanish subjunctive, then, is used in clauses embedded under a wide range of matrix verbs from different semantic classes, sometimes in variation with the indicative, sometimes without variation. Though heterogeneous, verbs taking the subjunctive have something in common: they entertain both polarities of the situation. In contrast, contexts conditioning the indicative consider only a single polarity. It is characteristic that one mood (subjunctive in Spanish) is exactly used for a wide range of contexts, as long as the context reaches a language-specific threshold of attenuation of certainty.

Systems with a larger number of moods can be analysed in similar terms.

Takelma has a rich system of moods. In addition to the distinction of realis and future, Takelma distinguishes an imperative and a remote imperative (the distinction is analogous to that between present and future, discussed above, where the remote imperative and future are used for situations 'distinctly set off' from the here-and-now), the inferential (discussed above), and the potential (used in the apodosis of counterfactual conditionals and deontic modality). The conditional (used specifically in the protasis of conditions) is yet another, periphrastic, mood.

Kayardild has an extremely rich set of verbal affixes expressing modality and temporality (N. Evans (1995a:252–66)). Among the concepts expressed are the following.

(i) The imperative – a direct order – and (ii) the hortative – an invitation involving the speaker and the addressee – are familiar.

(iii) Realis is used broadly for real situations – in the present time and in past time.

(iv) Past, as mentioned above, is a restricted past, used for activities and results that have been cancelled; the emphasis on cancellation – 'gone is the situation which once was and which might have continued' – is temporal and modal at the same time.

(v) The potential (positive *-thu ∼ ju*, negative *-nangku*) is the broadest irrealis mood. It can be used for future events (events predicted by the speaker as authority), as in *bukawa-thu* 'will die'; ability, as in *ngudi-nangku* 'not be able to throw over'; obligation, as in *kamburi-ju* 'should speak'; volitive, as in *kamburi-ju* 'want to speak'; and in purpose clauses.

There are still other, more restricted, moods. (vi) The conditional, mentioned above, is used in the protasis of conditions. (vii) There is even a mood expressing failed imminent action ('a crocodile almost bit me'), and (viii) a mood expressing apprehension over possible events:

Table 5.4 *Cardinal modal operators*

interrogative	Conceding lack of knowledge, speaker asks addressee to act as authority and correct lack of knowledge
evidentiality	Speaker indicates incompleteness of authority over knowledge
jussive (imperative/hortative/optative)	Speaker, as authority, asks addressee to act as a proxy authority and change the world from its inertial path
deontic	A general authority asks a proxy authority to act in one way (on all occasions, on some occasions) rather than in the opposite way.
attitudinal	An authority expresses a response to a (possible) state of the world that stands out from the usual states of the world
epistemic	The speaker as authority asserts the validity (under all conditions or under some) of the situation, on the basis of an implicit condition
contingency	One situation is the authority for another; without the condition, the consequence would not ordinarily be expected
indicative	Failure of any more specific modality opposing alternative realities: the speaker insists the addressee believe that the world is the way the speaker says it is, rather than the opposite

(72)   nyingka bayii-nyarra   kulkijiiwanharr
         you   get.bitten-APR shark
         '[watch out] you might get bitten^{APR} by a shark'

The 'apprehensive' mood of (72) expresses 'the undesirability of an event, and the need to avert it', or to put it in other words: 'the current world, which the speaker wishes would continue, is now $\neg\sigma$ (you are not currently bitten by a shark), yet there is a possibility of σ (shark-biting) arising in some not-so-distant world, which an authority – the speaker – hopes will not come to pass'. (ix) The desiderative mood gives the effect of mild obligation: 'it would be a good idea for . . .'. A desiderative situation is one that is desired by some authority. In comparison to the potential, the desiderative is 'more general' in its authority; and 'even where it is actually the speaker who is the source of the desire, the pragmatic effect of choosing the desiderative is to suggest it is a more generally held view'. By contrasting different degrees of authority, Evans's formulation confirms that deontic modality involves generalizing authority from the individual speaker to a general principle upheld by the community of speakers.

   Some important modal operators are summarized in table 5.4.

   There seem to be three realms of modality. One realm, epistemology, involves the degree of certainty of knowledge. With operations of this sort, it is a question of whether the speaker acts as the ultimate authority over knowledge. In a declarative indicative assertion the speaker claims authority over knowledge and categorically excludes the alternative history, but some moods indicate

that the speaker does not: *interrogative*, *quotative*, *evidential*. Then the speaker opposes the possibility of knowledge about some situation σ to indeterminacy of knowledge ('it is not clear whether σ') or doubt about the validity of the situation itself ('possibly ¬σ').

A second realm is that of *jussive* modality, of 'so-be-it' modality, of obligation and possibility. A situation does not hold now, or might be thought not to hold in all worlds, but an authority wills that it should be so, or that a secondary, a proxy, authority (the addressee of modality) should make the situation come to pass. Jussive modality includes, or shades into, deontic and attitudinal modality.

The third realm, contingency, examines the conditions under which a situation has one polarity or the other as a function of some other situation. Counterfactual conditions entertain one polarity as interesting and conceivable, even while conceding that the world is not so. In contrast to these three realms of positive modality, indicative (realis) modality insists on one polarity and excludes considering alternatives.

4   Aspect, tense, and modality, in text and in general

More than a century ago, it was said of Greek that 'the aorist differs from the imperfect by denoting the momentary occurrence of an action or state' and that 'the aorist is the tense most common in narration, the imperfect in description' (Goodwin (1880:24)). This longstanding insight can be extended to other aspectual systems distinguishing perfective and imperfective aspect or similar categories (see Hopper (1979), who distinguishes the foregrounding function of the perfective from the backgrounding function of the imperfective; Kamp and Rohrer (1983); Fleischman (1990:137), who introduces further distinctions). On a broader scale, one could go further and distinguish two general functions of language, each with its own characteristic verbal categories.[24] In *narrative* (foregrounding, history), situations are presented as a sequence of significant changes. Realis mood, liminal aspect, and past tense are the characteristic categories of narrative. In *discourse* (description, evaluation, backgrounding), the speaker contextualizes, explains motivations and causation, speaks from the heart and seeks to persuade the addressee. Discourse uses presents and perfects and imperfects and irrealis modality.

As an illustration, we might look at a tale from an Old Russian chronicle describing the fate of a tenth-century prince of Kiev named Oleg, given below in English translation with grammatical glosses. At the outset the tale is framed

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[24] Benveniste (1959), who terms the distinction 'histoire' as opposed to 'discours'; Weinrich (1964). For a summary of views of narrative informed by the analysis of literary (fictional) texts, see Prince (1993) and the references therein.

by an imperfect describing a general state: *And Oleg lived[IF] keeping peace with all lands*. As part of the background, the narrative reports, using a pluperfect, that at some earlier time *He had asked[PST.PF] sorcerers* for a prediction; he wanted to hear the answer to the question, *From what is[PRS] my death?*, expressed as direct speech in the present tense. This is classic discourse.

When, in response to this question, Oleg was told that his favourite horse would bring about his death, he responded with a directive to change the world from the history it was predicted to have: *he gave the order[AOR] to feed the horse but not to bring the horse to him*. Some years later, Oleg returns victorious from fighting Byzantium, he inquires about the horse. He learns that it died while he was away and responds with a mocking laugh: *He has died[PRS.PF], but I am[PRS] alive*. His speech is commentary inserted to make sense of the flow of events. It is expressed by means of a present perfect and present used in parallel; these are appropriate categories for discourse – for reporting states, facts, descriptions, editorial observations.

Through his mockery, of course, he commits a fatal error, which leads to the culmination of the narrative. He decides to ride out to see the bones of this prophetic horse: *and he dismounted[AOR] and nudged[AOR] with his foot the forehead of the horse's skull and, crawling out, a serpent pecked[AOR] him on the foot and from that he fell-ill[AOR] and died[AOR]*. All of this sequential, foregrounded narrative is expressed by aorists, the liminal aspect of Old Russian. The tale ends with a discursive statement about current relevance: *they buried[AOR] him on the hill where his grave is[PRS] to this day*.

The tale illustrates repeatedly the expected correlations between morphological categories and language functions: liminal aspect (the aorist) is used for sequential narrative, other categories – perfect and pluperfect, imperfect, present – for discourse. And yet, though this correlation between the morphology and text function usually holds, it may be that the opposition between narrative (foregrounding) and discourse (backgrounding) is not all there is to the dynamic of text.

Predicates, as they are used in texts, report histories of situations, or ultimately histories of situations in relation to possible situations, from some perspective. At each point in a text, when a new event is reported, it allows the addressee to project future histories that could develop from the current event. These projected futures are remembered and carried along as the text progresses. Later events respond to the futures projected earlier.

In this tale in particular, the sorcerer's prophecy projected one very specific future, producing a tension between two alternatives: will Oleg die because of his horse, as foretold by the sorcerer, or will he escape death, as he would prefer? The whole dynamic of the text derives from the tension between these alternative possibilities. Later events derive their meaning only insofar as they respond to these projected futures.

Oleg responds to the future foretold by the sorcerer by isolating the horse. In doing so, he attempts to nullify the future that was projected earlier in the prophecy and to project a new future more to his liking, one in which he would not die the death that has been fated for him. His act, then, responds to the inherited possibilities and, at the same time, creates new expectations. When he learns the horse has died, Oleg believes that the horse's death cancels the earlier prophecy and makes it safe for him to see the remains of his beloved horse. Again his actions respond to futures projected from an earlier event. The sorcerer and Oleg, who are authorities internal to the tale, both project futures, which differ and conflict. As addressees of the tale, we are aware of the conflicting futures, and of the conventions of the genre of cautionary tale.

As it turns out, Oleg ultimately dies, thereby confirming the future predicted earlier by the sorcerer and revealing the futility, and hubris, of anyone attempting to escape the future that was projected for him. His death is indeed a liminal event placed in sequence after other liminal events, as one expects in narrative, but it is much more than that. His death – the *dénouement* of this cautionary tale – derives its force from the way in which it responds to prior futures: the most recent future projected by man is not confirmed, the future projected earlier by fate is confirmed. Thus, events in a narrative text do more than just report a property or a change of a property. Every event invites projections about futures from that point on, and every event responds to the past possibilities that are projected from earlier events, which are carried along as the narrative advances. Both liminal aspect (perfective) and aliminal aspect (imperfective) can participate in this dynamic of responding to prior possibilities and projecting futures. The difference between them is that liminal events, by reporting change, typically reduce the range of possibilities, while aliminal events are consistent with multiple situations; they lead one to expect further developments.

Text, then, does not reduce to an alternation of narrative – plot-advancing, foregrounding events expressed by a liminal aspect in the past tense – and discourse – plot-retarding commentary and background expressed by other tense–aspect forms, though this alternation is certainly an important component of the dynamic. There is a modal component as well, whereby, at each point, the current predication is compared to the prior expectations, and, at each point, the current predication allows one to project and anticipate possible futures. Text is both temporal–aspectual and modal.

5   Suggestions for further reading

Since the 1980s there has been an explosion of literature treating these categories, especially aspect, in two partially distinct but intersecting traditions.

A tradition of natural language philosophy and related linguistic literature, building on the schematic observations of Reichenbach (1947) and Vendler's

formulation (1957) of Aristotelian lexical semantics, has attempted to model the semantics of aspect in a truth-functional fashion. The papers in Tedeschi and Zaenen (1981) deal specifically with lexical aspect in the spirit of Vendler. Dowty (1979) formalized the modal character of the English progressive: the current situation reported by the progressive is to be evaluated over an interval that extends beyond the current time into a set of branching futures. Recent treatments in this tradition are Herweg (1991), McGilvray (1991), Verkuyl (1993).

Another tradition has taken as its point of departure the morphologically encoded categories of specific languages and their meaning and pragmatics (not limited to truth-function). There is a layer of sophisticated textbook treatments: aspect in Comrie (1976a); Comrie (1985) for tense; and chapters of Lyons (1977) and Palmer (1986) for mood. Dahl (1985) gives definitions of prototypical categories and rigorously defined contexts for the usage of aspectual categories in a cross-linguistic perspective. Bybee and Dahl (1989) and Bybee *et al.*, (1994) outline the typical diachronic trajectories in the development of tense and aspect reported here. The use of tense and aspect in narrative is explored in depth (and with sophistication) in Fleischman (1991). Mood has received less attention, the studies in Bybee and Fleischman (1995) being exceptions.

Various studies describe the systems of particular languages, and it is now usual to find a discussion of these categories in grammars of individual languages. Sketches of specific languages can be found in Smith (1997) (English, French, Russian, Chinese, Navajo), Thieroff and Ballweg (1994) as well as Thieroff (1995) (the languages in Europe proper and on the periphery of Europe), and Anderson and Comrie (1991) (eight languages of the Cameroon in West Africa). Slavic and Finnic data are examined in papers in Thelin (1990). Berman and Slobin (1994) treats the acquisition of narrative in a half-dozen languages.

The boundaries between the two traditions have become blurred, and something of a common lore, perhaps even a consensus, has emerged. Binnick (1991) offers a balanced summary of both traditions (as well as older traditions). Declerck (1991) presents an original analysis of tense in English that appears to do it all.

6   Lexical nominalization

Bernard Comrie and Sandra A. Thompson

0   Introduction

The term *nominalization* means in essence 'turning something into a noun' (see
vol. I, chapter 1, for the internal and contextual characterization of 'noun'). In
this chapter we will be concerned both with what forms can turn into nouns and
with what kinds of nouns result from these operations.

The organization of this chapter, then, will be as follows: section 1 will
be a discussion of derivational devices that create nouns from lexical verbs
and adjectives. The resulting nouns may be the name of the activity or state
designated by the verb or adjective, or may represent one of its arguments.
Thus, we may categorize nominalizations as follows:

A Name of activity or state
    1 action/state nouns
B Name of an argument
    2 agentive nouns
    3 instrumental nouns
    4 manner nouns
    5 locative nouns
    6 objective nouns
    7 reason nouns

As we shall see, the difference between the forms in class A and those in
class B is that the A forms retain certain properties of the verbs or adjectives
they are related to, while those in B typically behave syntactically like other
nouns in the language, bearing only morphological and (often unpredictable and
idiosyncratic) semantic relations to the associated verb or adjective. Section 2
will be a somewhat more lengthy treatment of devices by which entire predicates
and propositions can be turned into noun phrases; included there will be a

discussion of the types of devices found, the verbal and nominal categories represented in the nominalization, the syntactic collocations of action nominals, and the functions of such nominalizations. Section 3 will briefly take up nouns derived from nouns, and section 4 summarizes the discussion.

1 Processes for forming nouns from lexical verbs and adjectives

1.1 Action/state nominalization

Most languages of the world make use of one or more devices for creating action nouns from action verbs and state nouns from stative verbs or adjectives, meaning the fact, the act, the quality, or occurrence of that verb or adjective. English has a rich array of suffixes for this purpose, a few of which are illustrated below:

(1)   create ⇾ creation
       arrive ⇾ arrival
       stupid ⇾ stupidity
       quiet   quietness

In Lakhota, a Sioux language of South Dakota (Buechel (1939:176)), there is a prefix *wó-* (and the stem-final *ā* of the verb may change to *-e* by a general rule):

(2)   a. gnayā́   ⇾ wógnaye
           to deceive   deception

       b. wiyuškī   ⇾ wówiyuškī
           to rejoice   rejoicing

In Semitic languages, derivation from one lexical class to another takes the form of various modifications of a three-consonant (= triliteral) root. Thus, in Hebrew, for example, the root *y-š-v* means 'to sit', *yašav* is 'sat', while *yešiva* means '(state of) sitting'. Similarly, *x-l-t* is 'to decide', *hexlit* is 'decided', and *haxlata* is 'decision'.

In some languages, an action/state noun can be formed from a verb phrase consisting of a verb and its object by reversing the order of the verb and the object. In English this strategy is very productive with *-ing*:

(3)   drive a truck   ⇾ truck-driving
       trim a tree   ⇾ tree-trimming
       hunt for a house   ⇾ house-hunting

A very similar process can be observed in Gwari, a Kwa language of Nigeria (see Hyman and Magaji (1970)), as well as in many other Kwa languages:

(4)   a. sī shnamá   ⇒ shnamásī
           buy yams   yam-buying

        b. zhnê tnútnû   ⇒ tnutnúzhni
           do work   work-doing

Some languages have different derivational processes for different semantic types of action/state nouns. A distinction which many languages make is that between a nominalization designating a process and one designating a non-process. Thai is such a language: the nominalizers *kaan* and *khwam* differ in that the former derives process nouns while the latter derives non-process nouns:

(5)   a. chyâ   ⇒ kaan chyâ

        b. believe   believing (process)
                        khwam chyâ
                        belief (non-process)

In fact, *kaan* cannot occur with stative attributive verbs (there is no separate category of adjectives in Thai):

(6)   a. dii   ⇒ khwam dii
           good   goodness
                        *kaan dii

        b. suǎj   ⇒ khwam suǎj
           beautiful   beauty
                        *kaan suǎj

These action/state nouns, then, are those that name the activity or state designated by the verb or adjective, those which we labelled as class A above. In the following sections we will discuss the types in class B, those which create the name of one of the arguments of the verb or adjective. The first type we shall consider is the agentive noun.

1.2   Agentive nominalization

A number of languages have a productive process whereby action verbs can be made into nouns meaning 'one which "verbs"'. We will refer to this process by the traditional label 'agentive nominalization' even though, strictly speaking, the noun need not be in an 'agent' relationship with the verb from which it is derived. In English, for example, the suffix *-er* derives nouns meaning 'one which "verbs"' from both agentive and non-agentive verbs:

(7)   a. sing ⇒ singer
        b. hear ⇒ hearer

In English, however, this process is constrained in certain ways: for example, *-er* may not be added to adjectives, and there are many stative verbs with which it cannot occur:

(8)   a. tall ⇒ *taller
                     tall <u>one</u>

        b. fall ⇒ *faller
                     <u>one</u> that falls/fell

But in Tagalog, the process is unconstrained: any verb or adjective may become a noun meaning 'one which "verbs"', simply by being used in a nominal slot in the sentence without any modification in its form (Schachter and Otanes (1972:150ff.)):

(9)   a. Iyon ang bago
           that TOP new
           'That's the new one'

        b. Iyon ang bumagsak
           that TOP fell
           'That's the one that fell'

Here are some further examples, where even the aspectual distinctions of the verb are maintained:

(10)   a. Magsasalita   si   Rosa
           speak.CNTMPL   ART Rosa
           'Rosa will speak'

        b. Nagsasalita   si   Rosa
           speak.IPFV   ART Rosa
           'Rosa is speaking'

        c. Nagsalita   si   Rosa
           speak.PFV   ART Rosa
           'Rosa spoke'

(11)   a. Nakita ko ang magsasalita
           saw   I   TOP speak.CNTMPL
           'I saw the one who will speak'

        b. Nakita ko ang nagsasalita
           saw   I   TOP speak.IPFV
           'I saw the one who is speaking'

        c. Nakita ko ang nagsalita
           saw   I   TOP speak.PFV
           'I saw the one who spoke'

The situation in Modern Hebrew is slightly different: here the agentive nominalization is morphologically indistinct from a verbal form, but it is specifically the participial form of the verb that serves this function:

(12)   šamar   ⇒ šomer
        (he) guarded   (he) guards / is guarding / a guard

In Zulu (Kunene (1974)), an agentive noun can be formed by prefixing to a verb root the prefix which occurs on all nouns in the human class, *um(u)-*, and replacing the verbal suffix *-a* by *-i*:

(13)   -cula ⇒ <u>um</u>-cul-<u>i</u>
        sing   singer

In some languages, agentive nominalizations can also be used to modify another noun. Mandarin Chinese is such a language; compare the expression translated by a relative clause in (b) with the agentive nominalization in (c):

(14)   a. Full sentence
            Tā chǎo-fàn
            he   cook-rice
            'He cooks'

        b. Relative clause
            chǎo-fàn-de   rén
            cook-rice-NZR   person
            'person who cooks'

        c. Agentive nominalization
            chǎo-fàn-de
            cook-rice-NZR
            '(a) cook'

1.3   *Instrumental nominalization*

In some languages there is a (typically morphological) process for forming from an action verb a noun meaning 'an instrument for "verbing"'. In Wappo, an indigenous language of California (as well as in a number of other languages of the Americas), this process is very productive. A suffix *-(e)ma* 'for the purpose of' is added to the verb root:

(15)   a. yo?-   ⇒ yok'ema
            sit   for the purpose of sitting = chair

        b. kač   ⇒ kačema
            to plough (V)   for the purpose of ploughing = plough (N)

        c. lat'-   ⇒ lat'ema
            to whip (V)   for the purpose of whipping = whip (N)

Lakhota (Buechel (1939:176)) has a similar process: *i-* is prefixed to a transitive verb root to form instrumental nouns:

(16) a. kahinta   ⇒ icahinte
          to sweep   broom

      b. kasleca   ⇒ icaslece
          to split   wedge

In some languages, the form that yields instrumental nouns is indistinguishable from that which forms agentive nouns. Thus, in Diola, an Atlantic language of the Niger-Congo family (J. D. Sapir (1965)), we find the suffix *-a* used for both instruments, as in (17a), and for agents, as in (17b):

(17) a. -lib   ⇒ ɛlib-a
          make slices   knife

      b. -tɛp   ⇒ atɛb-a
          build   builder

English, of course, is similar: *-er* is used in both functions:

(18) *Agentive*
      sing   ⇒ singer

(19) *Instrumental*
      slice   ⇒ slicer
      mow   ⇒ mower

1.4   Manner nominalization

Some languages have a special derivation pattern for forming nouns that mean 'way of "verbing"' from verbs. In Turkish, the suffix *-(y)iş* performs this function (where the form of the vowel may change according to regular rules of vowel harmony; Lewis (1967:172–3)):

(20) a. yürü-   ⇒ yürüyüş
          to walk   way of walking

      b. ye-   ⇒ yeyiş
          eat   way of eating

      c. yap-ıl-   ⇒ yapılış
          make-PASS   way of being made

In some languages, the action noun is indeterminate between a fact/ occurrence interpretation and a manner interpretation. English gerunds are like this: *his walking* can refer either to the fact or occurrence of his walking or to the way he walks. The action nouns in Hebrew are similar. Similarly in Zulu,

the verbal noun with an infinitival prefix can have both of these interpretations (Kunene (1974)). Thus:

(21)   -hamba ⇒ uku-hamba
         walk   INF-walk   = i   the fact of walking
                                    ii the way of walking

1.5   *Locative nominalization*

Some languages have devices for creating from a verb a noun that means 'a place where "verb" happens'. Many Bantu languages have such a device; here are examples from Si-Luyana (Givón (1970b)):

(22)   a. lóta   ⇒ li-   lot   -elo
            dream   CL 5/6 dream OBL = place of dreaming

         b. móna   ⇒ li-   mon   -eno
            see   CL 5/6 see   OBL = place of seeing

Sundanese, an Austronesian language of West Java, uses a circumfix *paŋ- . . . -an* for this function (Robins (1959:358)):

(23)   a. diuk ⇒ paŋdiukan
            sit   place of sitting = seat

         b. sare ⇒ paŋsarean
            sleep   place of sleeping = bed

In Hungarian (Edith Moravcsik (p.c.)), the same suffix used for agentive and instrumental nominalizations can form place nouns (*-ó* or *-ő* depending on vowel harmony):

(24)   a. ír   ⇒ író   (agentive)
            write   writer

         b. hegyez ⇒ hegyező (instrumental)
            sharpen   (pencil-)sharpener

         c. társalog ⇒ társalgó (locative)
            converse   place of conversing = parlour

         d. mulat   ⇒ mulató   (locative)
            have fun   place for having fun = bar

1.6   *Objective nominalization*

Some languages have an affix that forms nouns designating the result, or the typical or 'cognate' object of an action, such as *-um* in Diola (J. D. Sapir (1965)):

(25)   lib   ⇒ libum
         make slices   cuts, slices

Many Bantu languages have a similar device for creating a noun from a verb, where that noun means the object that results from an action. In Zulu, and in Si-Luyana, for example, a prefix for nouns in one of the nonhuman noun classes and the suffix *-o* will turn a verb into such a noun (Kunene (1974) and Givón (1970a)):

(26)   Zulu:
         a. -cabanga ⇒ um -cabang -o
            think   CL think   NZR = thought
         b. -cula   ⇒ i-   cul   -o
            sing   CL sing   NZR = congregation/hymn

(27)   Si-Luyana:
         a. -lóta   ⇒ lu-lot-o
            dream   a dream
         b. -ìmba   ⇒ lw-imb-o
            sing   a song

In Sundanese, the suffix *-an* is one affix that performs this function (Robins (1959: 347)):

(28)   a. inum   ⇒ inuman
            to drink   drink/alcohol
         b. omoŋ   ⇒ omoŋan
            to say   word/saying
         c. iŋət   ⇒ iŋətan
            to think   thought

In some languages, there is a process for taking a verb and forming a noun from it which names not the typical object nor the result of the activity denoted by the verb, but a noun with the passive meaning, that is 'thing/person that is "verbed"'. In Si-Luyana, for example, either a human or a nonhuman noun-class prefix may be added to a passive verb to form an objective noun (Givón (1970b:74–5)):

(29)   -móna ⇒ mu-   mon -wa
         see   CL 1/2 see   PASS = one who is seen
                    si-   mon -wa
                    CL 7/8 see   PASS = thing which is seen

1.7   Reason nominalization

Sundanese is an example of a language in which a noun meaning 'the reason for "verbing"' can be created from a verb (Robins (1959:351)):

(30)   a. dataŋ   ⇸ paŋdataŋ
           arrive   reason for arrival

        b. daek   ⇸ paŋdaek
           be willing   reason for being willing

        c. indit   ⇸ paɲindit
           leave   reason for leaving

1.8   Predictability and productivity

Languages typically show rather low predictability with respect to their noun-forming processes. In some, such as Hebrew, for example, there is no general way to predict the form of the action nominal from the form of the triliteral root. In English, there is slightly more predictability. For example, almost any polysyllabic verb ending in *-ate* will form its action noun by adding *-ion*, as in *create/creation*. Similarly, most adjectives ending in *-able* or *-ible* form nouns in *-ity*: *respectable/respectability*. But there is no way to predict, for example, that *refuse* will take *-al* while *accuse* will take *-ation* or that *true* will add *-th* (to give *truth*).

Similarly, in Zulu, while many verbs freely form agentive nouns, as in (31), there is no apparent way to predict that certain other verbs cannot form such agentive nouns, as shown in (32) (Kunene (1974:120–1)):

(31)   a. -lima   ⇸ um-lim-i
           cultivate   cultivator

        b. -diala   ⇸ um-dial-i
           play   player

        c. -cula   ⇸ um-cul-i
           sing   singer

(32)   a. -fulela   ⇸ *um-fulel-i
           thatch   thatcher

        b. -bhaceka ⇸ *um-bhacek-i
           plaster   plasterer

Semantically, it is very common to find a deverbal noun taking on special and unpredictable meanings, precisely because it is a noun and as susceptible to idiosyncratic semantic change as any other lexical item. One very typical type of semantic specialization is the concretization of action nouns. Thus, in

English, *proposal* may refer either to the fact or activity of proposing or to an actual statement or piece of writing in which an act of proposing is conveyed. However, *refusal* is much less amenable to a concrete interpretation:

(33)   His proposal / ?His refusal was fourteen pages long

An example of this type of semantic unpredictability in Hebrew involves the verbs *avad* and *pa'al*, both meaning roughly 'work', and their agent noun counterparts *oved* and *po'el*. While the verb *avad* generally takes an animate subject and includes physical labour as well as mental effort, the agent noun *oved* is used for white-collar workers; the verb *pa'al* is used of mechanisms or systems (a watch, a new method) in the sense of work as 'function, operate', but its morphologically related agent noun *po'el* refers to a blue-collar or manual labourer.

   Finally, we note one further type of unpredictability: a derivational process is often blocked just in case the language happens to have a lexical item already filling the 'slot' which the derived form would occupy. It is for this reason, for example, that the English agentive *-er* nominalization process does not apply to verbs such as *study*: the English lexicon already contains *student*. (For some discussion of the question of productivity in derivational morphology, see S. A. Thompson (1974)).

2   Processes for forming noun phrases from predicates and propositions

2.1   The 'action nominal'

In this section we will discuss various phenomena associated with the so-called 'action nominal', that is, a noun phrase that contains, in addition to a noun derived from a verb, one or more reflexes of a proposition or predicate. For example, in English, the term *action nominal* could refer to a noun phrase such as (34), in which *the enemy's* is a reflex of the subject and *of the city* is related to the object of the proposition (35).

(34)   the enemy's destruction of the city

(35)   The enemy destroyed the city

The term could also be used to refer to a noun phrase such as (36), in which *loud* relates to the adverb *loudly* and the prepositional phrase to its counterpart in the predicate (37).

(36)   the loud chanting in the quad

(37)   chanting loudly in the quad

The derived noun itself in the action nominal is formed by the process that creates action/state nouns from action or stative verbs, described above in section 1.1. It is a 'non-finite' verb form in the sense that it does not manifest any of the tense and/or agreement morphology found with verbs functioning as predicates in ordinary simple sentences. We shall examine the syntactic properties of action nominals in languages of various types, comparing the action nominal, on the one hand, with sentences expressing approximately the same information content and on the other hand, with non-derived noun phrases, i.e. comparing action nominal syntax with sentential (verbal) syntax and with nominal syntax. Perhaps the main result of this investigation, providing also a framework within which to structure the discussion, is that action nominals typically have some of the syntactic characteristics of both sentences and non-derived noun phrases, i.e. they occupy an intermediate position between these two categories; the extent to which action nominals are verbal or nominal varies considerably from language to language, as will be seen below. The intermediate status of action nominals between verbs and nouns can probably be used as one of the defining criteria of an action nominal. (For further illustration of the approach to the syntax of action nominals presented here, see Comrie (1976b) and Koptjevskaja-Tamm (1993).) We can illustrate this briefly with an example from English. If we compare the noun phrases in (38), the sentence (39), and the action nominal construction in (40) below, then we observe that, despite the close parallelism among the three types of constructions, the action nominal's internal structure parallels that of an ordinary noun phrase in that it takes genitive attributes, while in a sentence, subject and direct object are not marked by any preposition or ending.

(38)   the enemy's weapons/the weapons of the enemy

(39)   The enemy destroyed the city

(40)   the enemy's destruction of the city

Furthermore, the action nominal, like an ordinary noun, is modified by an adjective, as in (42), although the corresponding verb would have a manner adverb, as in (41). (Some speakers of English, it is true, can also keep a bit of verbal syntax by using a manner adverbial with the action nominal, as in (43).)

(41)   The enemy destroyed the city rapidly.

(42)   the enemy's rapid destruction of the city

(43)   ?the enemy's destruction of the city rapidly

With the so-called gerundive nominal in English, the internal structure is almost completely verbal (prepositionless direct object, manner adverbial), as in (44).

(44)   The enemy('s) destroying the city rapidly surprised everyone

Even here, however, there is one (optional) feature of noun phrase syntax, in the possibility of having the subject in the genitive, i.e. as if it is an attribute to a noun phrase rather than a verbal form. Thus the English derived nominal has very few verbal characteristics, the gerund very few nominal characteristics.

   The discussion of the remainder of this section is divided into two parts. In the first, section 2.1.1, we concentrate on whether and how verb-internal categories (e.g. tense, aspect, voice) are retained in action nominals, in relative isolation from other constituents of the action nominal noun phrase; we are not, of course, here interested primarily in the phonetic shape of morphological categories, but rather in whether or not those categories can be expressed as categories in the action nominal. Once we determine that a given category is expressed in the action nominal, we may then ask whether it is expressed in the same way as it would be in the corresponding verb. In addition, this section includes a brief discussion of the expression of noun-phrase-internal categories in action nominals (section 2.1.1.2). In the second part (section 2.1.2), we discuss the possibilities for combining verbs / nouns / action nominals with other constituents of the sentence / noun phrase, in particular: the valency of verbs / nouns / action nominals (the number and type of subjects, direct objects, other objects, genitival attributes, etc., that a verb / noun / action nominal may take), and also some wider collocational possibilities, for instance of verbs with manner adverbials and nouns with adjectives. Finally, we note briefly some data that seem to fall somewhat outside the present framework, namely properties of action nominals that seem to distinguish them from both verbs and non-derived noun phrases.

2.1.1   Verbal and nominal categories

2.1.1.1 Verbal categories.   In this section, we shall examine the extent to which such typically verbal categories as tense, aspect, voice, transitivity, and negation are retained in action nominals; since these categories are not typical of noun phrases in general, retention of such categories in action nominals is evidence of the (partial) verbal nature of such action nominals. We might expect the verbal category of mood to appear in action nominals as well, but in fact, as we are not aware of languages where mood is retained in action nominals (indeed, mood in any nonfinite verbal form seems relatively rare), we are led to assume that action nominals simply do not retain this verbal category; the same conclusion is reached by Koptjevskaja-Tamm (1993:103). When we speak of a verbal category being retained in an action nominal, we mean of course its retention *as a morphological category* (that is, actually expressed by a grammatical morpheme) in the action nominal. It is no doubt often possible to give a close paraphrase, by lexical means, of verbal categories

in action nominals – for example *your current failure to pay your bills* (compare present tense) – but such lexical paraphrases do not constitute morphological categories. As a final introductory point, it should be noted that total loss of or partial neutralization of some or all of the verbal categories of tense, aspect, mood, and voice is also characteristic of nonfinite verbal forms that are usually still considered part of the verbal paradigm (e.g. participles, converbs). Thus we seem here to be dealing with a cline of expressibility of verbal categories: finite verbs can express the most such categories, nonfinite verbs fewer, action nominals still fewer, and other noun phrases fewest of all.

2.1.1.1.1   Tense

The English action nominal provides a good example of the loss of tense vis-à-vis verbal forms. Corresponding to the basic past/nonpast distinction, for example *the enemy was destroying the city* versus *the enemy is destroying the city*, we have only the one action nominal *the enemy's destruction of the city*. In appropriate contexts, present or past time reference may be forced or preferred, but there is no overt category of tense. (For instance, (45) below would probably be assigned present time reference, and (46) past time reference.)

(45)   The enemy's destruction of the city is causing consternation

(46)   The enemy's destruction of the city was causing consternation

In English, nonfinite verbal forms also show some neutralization of tense opposition; actually, the past/nonpast distinction is combined with the perfect/nonperfect aspectual distinction to give a single opposition, past-or-perfect versus nonpast, for example:

(47)   Having heard so many lies from you before, no one is prepared to
         believe what you're saying now

The paraphrase with a finite verb would be: *Since they have heard so many lies* . . . (perfect).

(48)   Having heard so many lies from you at the previous meeting, no-one
         is prepared to believe what you're saying now

The paraphrase with a finite verb would be: *Since they heard so many lies* . . . (past).

(49)   Walking down the street, I usually meet many other students from
         the institute

The paraphrase with a finite verb would be: *When I walk / am walking down the street* . . . (present – more strictly, relative present, see below). With the action nominal, not even this much of a tense distinction can be made.

In some languages, however, tense distinctions can (or even must) be made, at least with some action nominals. In Turkish, for instance, the action nominal in *-dik* is nonfuture, as in (50), whereas that in *-ecek* is future, as in (51) (Lewis (1967:254)).

(50)   Çocuk-lar-a asağıya inip   kendisi-ni sokak-ta
        child-PL-to down   descending   her-ACC   street-in
           bekle-***dik***-leri-ni   söyle-di
           await-VN-their-ACC   say-3SG.PST
        'She told the children that they went (had gone) down and waited
        for her in the street'

(51)   Çocuk-lar-a asağıya inip kendisi-ni sokak-ta bekli-***yecek***-leri-ni
        söyle-di
        'She told the children that they would go down and wait for her in
        the street'

Although the range of tense distinctions here is not identical to that found with finite verbs (for instance, in that there is no past/nonpast distinction), still the future/nonfuture distinction is possible, indeed required. Actually the distinction here is primarily one of relative tense: the *-ecek* verbal noun refers to a situation subsequent in time to that of the verb on which it is dependent, and the *-dik* verbal noun to a situation prior to or simultaneous with that of the verb on which it is dependent. The interpretation of the tense category as relative rather than absolute tense is very common generally with nonfinite verbal forms: thus if, in examples (47–49) above, one were to replace the main verbs *is (prepared)* and *meet* by their past tense equivalents *was (prepared)* and *met*, then the participial forms would be, respectively, perfect, past, and present relative to the past time reference of the main verb, i.e. paraphrasable as, respectively, *since they had heard* . . . , *since they had heard* . . . (English does not distinguish overtly between perfect-in-the-past and past-in-the-past), *when I walked / was walking*.

2.1.1.1.2 Aspect

In some languages that have an aspectual distinction (e.g. perfective vs imperfective), the categorial distinction is usually lost with verbal nouns, as in Russian, where, for example, corresponding to the imperfective *pisat́* and perfective *napisat́* 'to write' there is only the one action nominal *pisanie*:

(52)   Pisanie takix statej daet mnogo radosti
         'The writing of such articles gives much pleasure'

In this sentence, the sense may be either that pleasure is given by the fact
of involvement in the act of writing (imperfective), or that pleasure is given
by the fact that one has completed the act of writing (perfective). In a few
instances, Russian does seem to have a morphological distinction in action
nominals corresponding to that found in verbs: for example, corresponding to
the verbal pair *rassmatrivat´* (imperfective) / *rassmotret´* (perfective) 'to exam-
ine', we have action nominals *rassmatrivanie* and *rassmotrenie*. However, the
difference between such action nominals is lexical rather than aspectual: *rass-
motrenie* refers primarily to examination or scrutiny as a legal term, whereas
rassmatrivanie is the semantically neutral action nominal of the pair. In Polish,
on the other hand, we find that the aspectual distinction imperfective/perfective
is quite widespread with action nominals, so that, corresponding to the verbal
pair *czytać* (imperfective) / *przeczytać* (perfective) 'to read', we have the action
nominals *czytanie/przeczytanie*.

(53)   Czytanie tej książki dało dużo radości
         'The reading of that book gave much pleasure'

Czytanie in (53) refers to the process of reading which gave pleasure.

(54)   Przeczytanie tej książki dało dużo radości

With *przeczytanie*, reference is to the totality of the act of reading which resulted
in giving pleasure. In both Polish and Russian, nonfinite verbal forms (infini-
tives, participles, and converbs) do show aspect, so that failure to show aspect
in the action nominal is a clear loss of a verbal category; in Russian, this loss
is much more widespread than in Polish.

2.1.1.1.3   Voice

In many languages, there is no overt morphological distinction in action nomi-
nals corresponding to that between active and passive verbal forms, as can be
seen from the English (55–58), Russian (59–62), and Maori (63–6) examples
below:

(55)   The enemy destroyed the city

(56)   the enemy's *destruction* of the city

(57)   The city was destroyed by the enemy

(58)   the city's *destruction* by the enemy

(59)   Vrag rasrušil gorod
         'The enemy destroyed the city'

(60)   *rasrušenie* goroda
         'the destruction of the city'

(61)   Gorod byl rasrušen vragom
         'The city was destroyed by the enemy'

(62)   *rasrušenie* goroda vragom
         'the destruction of the city by the enemy'

(63)   Ka patu te tangata i   te wheke
         PCL kill the man   DO the octopus
         'The man killed the octopus'

(64)   te *patu-nga* a te tangata i   te wheke
         the kill-VN   of the man   DO the octopus
         'the man's killing of the octopus'

(65)   Ka patu-a   te wheke   e te tangata
         PCL kill-PASS the octopus by the man
         'The octopus was killed by the man'

(66)   te *patu-nga* o te wheke   e te tangata
         the kill-VN   of the octopus by the man
         'the killing of the octopus by the man'

The forms *destruction*, *razrušenie* ('destruction'), and *patunga* ('killing') occur both where one would have active verbs and where one would have passive verbs. However, if we look not simply at the morphology, but also at the syntax of such constructions, in particular at the valency (number and kind of noun phrase arguments) of the action nominal relative to the valency of active and passive verbs – note in particular the expression of the passive agent – then we see that there is motivation for saying that in these languages the syntactic active/passive distinction is maintained, although it is not maintained morphologically. We shall return to this phenomenon below.

In other languages, however, the active/passive distinction with the action nominal is made both syntactically and morphologically: in Turkish, the passive suffix is *-il*, and the introduction of the agent, though somewhat unnatural with the Turkish passive, is possible:

(67)   Hasan mektub-u yaz-dı
         Hasan letter-ACC write-3SG.PST
         'Hasan wrote the letter'

(68)   Hasan-ın   mektub-u   yaz-ma-sı
         Hasan-GEN   letter-ACC   write-VN-his
         'Hasan's writing of the letter'

(69)   Mektub (Hasan tarafindan) yaz-ıl-dı
         letter   Hasan   by   write-PASS-3SG.PST
         'The letter was written (by Hasan)'

(70)   mektub-un (Hasan tarafindan) yaz-ıl-ma-sı
         letter-GEN   Hasan   by   write-PASS-VN-his
         'the letter's writing (being written, the writing of the letter)
             (by Hasan)'

In claiming that traces of voice in action nominal constructions are instances of verbal non-nominal syntax in the action nominal, we are of course assuming that non-derived noun phrases do not and cannot exhibit the same phenomena. This might seem to be called into question by data from English, where even with non-derived nouns like *book* we have a range of possibilities similar to that of a derived noun like *refusal*:

(71)   Shakespeare's latest book

(72)   the latest book by Shakespeare

(73)   John's refusal (to approve the plan)

(74)   the refusal by John (to approve the plan)

In particular, the *by*-phrase in (72) would seem to indicate that even non-derived noun phrases allow a passive agent (cf. Chomsky (1970:206–7)). However, whatever analysis is given to noun phrases like (72) in English, the 'passive of a non-derived noun phrase' analysis is not generalizable to (all) other languages, since there are many languages where non-derived nouns like *book* do not allow a passive agent although action nominals do. Thus in Russian we have (75), but not (76), alongside both (77) and (78).

(75)   kniga Tolstogo
         'Tolstoy's book'

(76)   *kniga Tolstym
         'the book by Tolstoy'

(77)   čtenie Ivana
         'Ivan's reading'

(78)   čtenie knigi Ivanom
         'the reading of the book by Ivan'

In such languages, passive-like features of action nominals are more clearly instances of verbal, not nominal, syntax.

2.1.1.1.4   Transitivity

A somewhat similar distinction which, in some languages, is made with verbs but not with action nominals is that between transitive (causative) and intransitive (inchoative) members of a verbal pair. In English there is typically no distinction even with the verb – for example *open* (transitive) versus *open* (intransitive), so that there is no *loss* of distinction in the action nominal:

(79)   the opening of the door (cf.: someone opened the door)

(80)   the opening of the door (cf.: the door opened)

In Russian, this distinction must be made with the verb, as in (81–2) and cannot be made with the action nominal.

(81)   Kto-to otkryl dver´
         'Someone opened the door'

(82)   Dver´otkryla-s´
         'The door opened'

The intransitive verb has the so-called reflexive suffix *-s´/-sja*, which never occurs with action nominals, as seen in (83–4).

(83)   otkrytie dveri   (cf. both (81) and (82))
         'the opening of the door'

(84)   *otkrytie-s´/*otkrytie-sja dveri
         'the opening (by itself) of the door'

In Polish, on the other hand, the distinction is made with both verbs and the action nominal (the *się* here is the so-called reflexive morpheme, corresponding to the Russian -*sja* above).

(85)   Ktoś otworzył drzwi
         'Someone opened the door'

(86)   Drzwi otworzyły się
         'The door opened'

(87)   otwieranie drzwi
         '(someone's) opening of the door'

(88)   otwieranie siędrzwi
         'the (possibly spontaneous) opening of the door'

2.1.1.1.5   Negation

As a final verbal category in terms of which to view action nominals, let us consider negation.

Logically, there are three ways in which an action nominal could be negated: (i) in the same way as sentences, (ii) in the same way as nouns, (iii) in a way different from that found with either nouns or verbs. Thai shows case (i), English exemplifies both case (i) and case (ii), while Modern Hebrew presents us with case (iii).

Action nominals in Thai are negated in exactly the same way as are sentences, with the preverbal particle *may*, as seen in (89).

(89)   a. John ***may*** ʔaan-naŋsɨɨ
            John   NEG   read-book
            'John doesn't study'

        b. kaan ***may*** ʔaan-naŋsɨɨ khɔɔŋ John
            NZR   NEG   read-book   of   John
            'John's not studying'

In English, sentences are negated with *not*, while nouns are negated with *non-*:[1]

(90)   a. Harry is ***not*** my brother
        b. This is a ***non***-party

In action nominals, the sentential negator *not* is rigidly excluded and only the nominal negator *non-* can be used, as in (91), suggesting again that the English action nominal is rather close to the noun end of the nominal–verbal scale.

(91)   Gloria's non-participation / *not participation in the meeting
        surprised me.

The more verbal gerund may occur with either, though *not* is preferred if adjuncts are present; compare (92) and (93).

(92)   *Gloria's ***not*** participation

(93)   a. Gloria's not running
        b. Gloria's non-running
        c. *Gloria's non-running in the marathon

In written Modern Hebrew, a negative particle *iy-*, which is used for negating neither sentences nor nouns, is found in action nominals:

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[1] Lewis Carroll's *un-birthday* notwithstanding.

(94) a. Hem lo   amdu   al zxut-am
          they NEG insisted on right-their
          'They didn't insist on their right'

      b. iy-amidat-am   al zxut-am
          non-insistence-their on right-their
          'their non-insistence on their right'

2.1.1.1.6 Summary

Thus, of the typically verbal categories of mood, tense, aspect, voice, transitivity, and negation, we see that mood is (apparently) always absent from the action nominal; tense usually so (though some languages have some tense differentiation here); and aspect rather less usually so. Voice as a morphological category tends (but only tends) to be absent, although there are often grounds for retaining it as a syntactic category with action nominals; and transitivity tends not to be expressed. Negation can typically be expressed, but the negative marker itself may be a verbal negative morpheme, a nominal negative morpheme, or a special form found only in nominalizations.

2.1.1.2 Nominal categories. The main categories that we shall look at in connection with the action nominal are case, number, and definiteness. If other noun phrases of a language show these categories, then so, in general, do action nominals; indeed, with respect to case and definiteness in particular, this is almost a defining characteristic of action nominals. Thus, the use of the definite article with action nominals in English and Classical Arabic parallels its use with other noun phrases, as seen in (95–8) and (for Arabic) (99–102); in both languages, as it happens, the definite article is in complementary distribution with a possessor in the genitive (in English, with *'s*).

(95)   the bread

(96)   the arrival

(97)   John's bread

(98)   John's arrival

(99)   al-xubzu
        'the bread'

(100)   al-qatlu
        'the killing'

(101)   xubzu zaydin
        'Zaid's bread'

(102)   qatlu zaydin
         'Zaid's killing'

Note that in both English and Arabic the possessor (*John/Zaid*) can be under-
stood as either the agent or the patient of the proposition expressed by the action
nominal.

Number is more difficult to signal in action nominals, since certain non-
derived noun phrases, in particular abstract noun phrases (e.g. *the weather*), do
not show number, and, since action nominals fall into this class, they would be
expected not to show number for this reason, quite irrespective of their charac-
terization in terms of nominal and verbal categories. Number is normally shown
only when it can be understood as signalling 'occurrences', or 'cases' of 'verb-
ing', as with English *murders* for individual acts of murder, or *protestations* for
individual occurrences of protesting.[2]

The case category might seem relatively trivial, but in fact some languages
demonstrate the ***partially*** nominal character of certain action nominals by allow-
ing them to stand in only a restricted number of cases, rather than the full gamut
of cases allowed to other noun phrases. In this respect, the Turkish verbal noun
in *-mak* is very much a noun, but not completely so: it may stand in any case
except the genitive (Lewis (1967:167–9)). Finnish has a number of forms (tra-
ditionally called 'infinitives') which are nouns derived from verbs, although
only a limited number of these nominalizations are used, often with specialized
meaning. For instance, the so-called second infinitive occurs only in the inessive
and instructive cases. The basic meaning of the inessive is to indicate 'place in
which', for example *talo* 'house', *talo-ssa* 'in (the) house'. The inessive of the
second infinitive indicates an action simultaneous with that of the main verb,
as in (103).

(103)   Meidän kirjoittae-ssa-mme hän luki   kirjaa
         our   writing-INESS-our   he   read.PST book
         'While we were writing (during our writing) he was reading a book'

(The suffix *-mme* in this example is a first person plural possessive ending,
correlating with the (omissible) genitive pronoun *meidän*.) The basic meaning of
the instructive is to express adverbials of manner or means (e.g. *omin avuin* 'by
one's own abilities'), and the instructive of the second infinitive also indicates
the manner in which the action of the main verb is carried out, as in (104).

(104)   Pullo lensi suhiste-n   halki   ilman
         bottle flew whistling-INSTRC through air
         'The bottle flew whistling through the air'

---

[2] This suggestion is due to Ruth Berman.

With the category of case, then, we find further evidence that there are forms
intermediate between noun and verb (or, more generally, non-noun). There is
also a diachronic aspect to such intermediate forms, in that there are many
instances where they represent an intermediate historical stage in the verbaliza-
tion of nominal forms. For instance, the infinitive in *-ti* (or *-tʹ*) in most Slavic
languages derives historically from the locative case of a verbal noun; in Old
Church Slavonic, and still to a limited extent in Slovene, this contrasts with the
old accusative of this verbal noun in *-tb* (or *-t*), but in the modern Slavic lan-
guages the infinitive has been completely integrated into the verbal paradigm
and has virtually all of the typically verbal categories (apart from person and
number, lacking as in most nonfinite forms), and none of the typically nominal
categories.

2.1.2   Syntactic collocation

2.1.2.1 Valency.   Perhaps the most interesting evidence for the hybrid verbal–
nominal nature of the action nominal comes from the expression of subject and
direct object with the action nominal; other kinds of objects (marked objects)
provide, in general, less interesting material, since they usually occur in the
same form with both verb and action nominal, as in the following English and
German examples (105–6) and (107–8).

(105)   Harry objected to Bill's solution

(106)   Harry's objection to Bill's solution

(107)   Willi spottet über den Armen
         'Willi makes fun of (lit.: 'over, about') the poor chap'

(108)   Willis Spott über den Armen
         'Willi's mockery of the poor chap'

With subject and direct object (unmarked adjuncts), however, there is a greater
extent to which the action nominal, despite its clear semantic relation to a
sentence, accommodates itself to noun phrase syntax.

2.1.2.1.1   Subjects and objects assimilate to NP syntax

a. English. The relevant aspects of sentence syntax in this section are simply
that a sentence contains a verb preceded by a subject (with no overt case marking,
apart from such pronouns as ***I/me*** with a nominative/accusative distinction),
and possibly (depending primarily on which lexical verb is under discussion)
followed by a direct object (again with no overt case marker, apart from the
above-mentioned pronouns):

(109)   John arrived

(110)   The enemy destroyed the city

As far as noun phrase syntax is concerned, and we are here dealing first with non-derived nouns, instead of adjuncts lacking any overt marker, we find instead the possibility of a preposed noun phrase with the ending *-'s* (Saxon genitive) and of a postposed adjunct with the preposition *of* (Norman genitive):

(111)   John's car

(112)   the roof of the house

The Saxon genitive is, essentially, in complementary distribution with the definite article, i.e., were it not for the *John's* of *John's car*, we should have *the car*.

  Turning now to action nominals, and using as examples those corresponding to (109–10) above, we see that the internal structure is much more similar to that of a noun phrase, as in (113–114).

(113)   John's arrival

(114)   the enemy's destruction of the city

Moreover, if the Saxon genitive is absent, the definite article appears, as in (115–116).

(115)   the arrival

(116)   the destruction of the city (by the enemy)

Although the internal structure is more similar to that of a noun phrase, with Saxon and Norman genitive rather than 'nominative' and 'accusative', yet still there is a close connection between the two kinds of genitive in these action nominals and the subject / direct object distinction with sentences: Saxon (prenominal) genitive corresponds to subject (preverbal), while Norman (postnominal) genitive corresponds to direct object (postverbal).

(117)   the enemy – destroyed – the city

(118)   the enemy's – destruction – of the city

This is an absolute correspondence where both genitives are present, i.e. *the enemy's destruction of the city* cannot be the derived nominal of *the city destroyed the enemy*.

  In action nominal constructions with only one genitive, the interpretation of that genitive as corresponding to subject or direct object of the verb is more complex, except, of course, with action nominals of intransitive verbs, where the genitive cannot correspond to a (non-existent) direct object. Taking the Saxon

genitive first, we find that, in general, where the action nominal corresponds to a verb that *requires* a direct object, then in the absence of a Norman genitive the Saxon genitive must be interpreted as corresponding to a direct object, as in (119).

(119)   Bill's execution

Example (119) is interpreted as denoting an event whereby (someone) executed Bill, not one whereby Bill executed someone, as there is no *Bill executed. Where, however, the action nominal corresponds to a verb that does not require, but only allows, a direct object, then there is a tendency for only that interpretation to be possible where the Saxon genitive corresponds to the subject of the verb, often in defiance of real-world probability. Thus (120) is interpreted in correlation with *John reads*, and (121) in correlation with *Shakespeare reads*, not *(someone) reads Shakespeare*, despite the greater likelihood of a discourse being about someone's reading of Shakespeare.

(120)   John's reading

(121)   Shakespeare's reading

Furthermore, (122) is grammatical, though nonsensical in any literal interpretation, if it corresponds to *the book reads*; ungrammatical if it corresponds to *(someone) reads the book*.

(122)   ?the book's reading

There are still some unaccounted-for examples left over – for example, both *John's performance* (cf. *John performed*) and *the play's performance* (cf. *(someone) performed the play*) are possible – but the general tendency described remains. With the Norman genitive, there seems to be at best a tendency for this post-head genitive to be interpreted as object of the action nominal, although the subject interpretation is rarely completely excluded, as in *the shooting of the hunters*. We shall see below that some other languages have a tendency to discriminate between genitives interpreted as subject and those interpreted as direct object of an action nominal in ways similar to that discussed here for English.

   b. Russian. As we showed above, one of the characteristics of English noun phrase syntax is the existence of two types of genitive, Saxon and Norman; the difference between them is utilized in action nominal noun phrases to a large extent to correlate with that between subject and direct object of a verb. This use of two genitives seems to be relatively rare among the languages of the world: it exists to a limited extent in German, though here there is a strong tendency for there to be only a preposed genitive or only a postposed genitive, largely

irrespective of subject or direct object correspondence. An expression such as the following is rare:

(123)   Herrn Dührings Umwälzung der Wissenschaft
         'Mr Dühring's overturning of science'

   Russian, on the other hand, has only one genitive construction, which usually follows its head noun. In certain styles it may precede, but this is a reflection of (relatively) free word order, and not, as in English or German, of a separate syntactic position. In an action nominal, a genitive can in principle correspond to either a subject or a direct object, so that one finds examples like (124–5), with either only a subject or only a direct object.

(124)   priezd soldatov
         'the arrival of the soldiers'

(125)   razrušenie goroda
         'the destruction of the city'

Compare these with the sentences (126–127).

(126)   Soldaty priexali
         'The soldiers arrived'

(127)   Razrušili gorod
         'They (unspecified) destroyed the city.'

What is impossible in Russian (and in many other languages), however, is the combination of subjective and objective genitive within a single action nominal noun phrase, as in English *the enemy's destruction of the city*. The equivalent string in Russian might seem to be either (128) or (129).

(128)   razrušenie   goroda   vraga
         destruction of.city of.enemy

(129)   razrušenie   vraga   goroda
         destruction of.enemy of.city

But although these are well formed in Russian, they do not mean 'the enemy's destruction of the city', but, respectively, 'the destruction of the enemy's city' and 'the destruction of the city's enemy', that is, in both cases we have a head noun with a single genitive dependent on it, i.e. [*razrušenie* [*goroda vraga*]] and [*razrušenie* [*vraga goroda*]]. In fact, there is no way of translating literally into Russian *the enemy's destruction of the city*; the greater restrictiveness of Russian noun phrase syntax, coupled with the fact that action nominals reflect noun phrase rather than sentence syntax, means that certain possibilities that are open to English are impossible here.

It is possible to translate *the enemy's destruction of the city* into Russian, namely as (130).

(130)   razrušenie   goroda   vragom
          destruction of.city   by.enemy

However, this corresponds more literally to 'the destruction of the city by the enemy' than to 'the enemy's destruction of the city'; compare the discussion of 'passive' action nominals in section 2.1.1.1.3. Example (130) should be compared with the passive sentence (131).

(131)   Gorod byl razrušen vragom
          'The city was destroyed by the enemy'

In comparing the sentence in (131) with the action nominal in (130), we note that the sentence has a subject but no direct object, therefore the subject corresponds to a genitive in the action nominal noun phrase; *vragom* 'by the enemy' is neither subject nor direct object, and therefore remains unchanged in the action nominal noun phrase.

c. Czech. At first sight, Czech might seem to exhibit essentially the same pattern as (the genetically closely related) Russian: subjects of sentences are in the nominative case, direct objects in the accusative; genitives (typically posthead) occur both with non-derived nouns and with action nominals, in the latter case interpretable as corresponding to either the subject or the direct object of a verb; it is not possible to have both subjective and objective genitive qualifying the same action nominal, although 'passive' paraphrases are possible. These possibilities and restrictions are illustrated in (132–8).

(132)   Starý vědec přišel
          'The old scientist arrived'

(133)   příchod starého vědce
          'the old scientist's arrival'

(134)   Upálili Jana Husa
          'They (unspecified) burnt Jan Hus'

(135)   upálení Jana Husa
          'the burning of Jan Hus'

(136)   Člověk vykořistuje člověka
          'Man exploits man'

(137)   *člověka (GEN) vykořist'ování člověka
          'man's exploitation of man'

(138)   vykořist'ování člověka člověkem
          'the exploitation of man by man'

However, there is one important difference in (non-derived) noun phrase syntax between Czech and Russian (and English): in Czech, wherever possible, the adnominal genitive is replaced, preferably, by a possessive adjective in *ův* (stem *-ov-*) or *-in*.[3] That is, the genitive form found in (139) is much less natural than the possessive adjective form seen in (140):

(139)　?kniha　vědce
　　　　book　 scientist.GEN

(140)　vědcova kniha
　　　　'the scientist's book'

Like other adjectives in Czech, *vědcova* is typically prenominal, and it agrees with its noun in number, case, and gender.

This same preference for possessive adjectives, subject to exactly the same restrictions as in non-derived noun phrases, carries over into action nominal noun phrases, in particular in correspondence with the subject of the corresponding verb (see further below). Although (133), i.e. *příchod starého vědce*, is the only possibility given the attribute on 'scientist', without this attribute the possessive adjective would be preferred, as in (142) rather than (141).

(141)　?příchod vědce

(142)　vědcův příchod
　　　　'the scientist's arrival'

Since the prenominal possessive adjective and the postnominal genitive represent distinct syntactic positions in Czech, it is possible for both to occur with the same head noun. Just as in English one finds Saxon genitive$_1$ – action nominal$_2$ – Norman genitive$_3$ corresponding to subject$_1$ – verb$_2$ – direct object$_3$, so in Czech one finds possessive adjective$_1$ – action nominal$_2$ – objective genitive$_3$, as in (143).

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[3] The qualification *wherever possible* is necessary because of the following restrictions on the formation of possessive adjectives. There is first of all a semantic restriction: only singular definite noun phrases allow possessive adjectives, i.e. there is no possessive adjective alternative to the genitive in *kniha vědců* 'the scientists' book' or *kniha (jednoho) vědce* 'a scientist's book'. Secondly, there is a syntactic restriction: only unqualified nouns allow possessive adjectives, i.e. there is no alternative to the genitive in *kniha starého vědce* 'the old scientist's book'. Thirdly, there are idiosyncratic morphological restrictions, in that nouns of certain morphological classes simply do not form possessive adjectives – for example neuter nouns in *-ě* (stem *-ět-*) such as *dítě* 'child' – so that there is no alternative to the genitive in *kniha dítěte* 'the child's book'. Where none of these restrictions applies, the possessive adjective is preferred to the genitive. We should also note that adjectives like *vědců* are clearly possessive adjectives, meaning 'the scientist's', and not relational adjectives of the type 'scientific', which are formally distinct from possessive adjectives in Czech: 'scientific book' would be *vědecká kniha*.

(143)   Leninova kritika mylných názorů oportunistů
         'Lenin's criticism of the erroneous views of the opportunists'

The difference between Czech noun phrase syntax (the possibility of prenom-
inal possessive adjectives) and Russian noun phrase syntax (which virtually
lacks this possibility) means that Czech has, for noun phrases, including action
nominals, of the appropriate class, a syntactic possibility that is lacking in Rus-
sian. This possibility in Czech is very similar to the Saxon genitive in English,
except that it is subject to the constraints mentioned in note 3.

   Although we have illustrated the use of possessive adjectives in action nom-
inals with Czech material, since the possibility for forming such adjectives is
very widespread and productive in Czech, the same possibility does exist to a
more limited extent in many other languages, including English and Russian, in
particular with pronouns. Thus English has (pronominal) possessive adjectives
my, *your*: cf. Russian *moj*, *tvoj*. In Russian, these can be used in correspondence
with the subject of a verb, just like possessive adjectives in Czech, even where
there is also an objective genitive present, as in (144).

(144)   moe razrušenie goroda
         'my destruction of the city'

One slight complication in Russian is that some forms occupy an interme-
diate position between genitive and possessive adjectives: the third person
forms *ego* 'his, its', *ee* 'her', *ix* 'their', unlike the first and second person
forms, are morphologically genitives; however, they also have some of the
syntactic properties of possessive adjectives, for instance in that they usually
precede their head noun, and can co-occur with a postnominal genitive, as
in (145).

(145)   ego razrušenie goroda
         'his destruction of the city'

   Just as in English the distinction between Saxon and Norman genitive corre-
lates to some extent with that between subject and direct object, so, in Czech, the
distinction between prenominal possessive adjective and postnominal genitive
often corresponds to that between subject and direct object, as in (146–7).

(146)   matčina ztráta
         'mother's loss (of something)'

(147)   ztráta matky
         '(someone's) loss of (his) mother'

The preference for the genitive in (147) represents a difference between action
nominal noun phrase syntax and non-derived noun phrase syntax, since in the
latter the possessive adjective *matčin-* would invariably be preferred to the

genitive *matky*, for example *matčina kniha* is greatly preferred to *kniha matky* for 'the mother's book'. Overall in Czech, there is near identity, right down to idiosyncratic details, between the syntactic structure of action nominal noun phrases and non-derived noun phrases; the main exception is the utilization of the possessive adjective / postnominal genitive distinction to correspond to subject versus direct object, and here the structure of the action nominal noun phrase differs from that of other noun phrases in order to parallel more closely the syntactic structure of a sentence.

2.1.2.1.2   Subjects and objects retain sentence syntax: Tamil and Avar

At the opposite extreme from English (where subjects and direct objects of action nominals are completely assimilated to noun phrase syntax) we find languages like Tamil (a Dravidian language) and Avar (a Northeast Caucasian language) where the internal syntax of the action nominal noun phrase, as far as subject and direct object are concerned, is like that of a sentence and different from that of a noun phrase. In Tamil, subjects have no inflection, while direct objects either have no inflection or take the suffix *-ai* (if definite and/or animate), as in (148).

(148)   Nīṅkaḷ it-ai   cey-t-īrkaḷ
        you   this-ACC do-PST-2PL
        'You did this'

Genitives take either no ending or one of the endings *-in*, *-uṭaiya*: the possibility of one of these endings, versus their impossibility with subjects or direct objects, is a sufficient criterion for distinguishing genitives from other uninflected noun forms. In the action nominal construction, the genitive forms are excluded, and the morphology of subject and direct object is as in a sentence, as seen in (149).

(149)   Nīṅkaḷ it-ai   cey-tal tarmam
        you   this-ACC do-VN right.conduct
        'Your doing this is right'

In Avar, subjects of intransitive verbs and direct objects take no ending, while subjects of transitive verbs stand in the so-called ergative case, as in (150).

(150)   Du-ca   t'eẋ   c'al-ula
        you-ERG book read-PRS
        'You read the book'

With the action nominal, this same construction remains, as in (150), although in non-derived noun phrases one would find genitive *du-r* 'your' or genitive *t'oẋ-ol* 'of the book' (cf. *dur ču* 'your horse').

(151)   Du-ca   t'eẍ   c'al-i   bugo c'aq' łik'ab iš
         you-ERG book read-VN is   very   good   thing
         'Your reading the book is a very good thing'

Having now examined the two poles – complete assimilation to noun phrase syntax (English, Russian, Czech) and complete retention of clause syntax (Tamil, Avar) – we shall go on to some instances where assimilation to noun phrase syntax is only partial.

2.1.2.1.3   Subjects and objects only partially assimilate to NP syntax

a. Turkish. A clear example where assimilation to noun phrase syntax in the action nominal construction is only partial is provided by Turkish. Sentences in Turkish have a subject in the absolute case (no ending) and a direct object in either the absolute case (if indefinite) or the accusative case (if definite) with the ending *-ı/-i/-u/-ü* (variants here and below are vowel harmony variants); for the sake of simplicity, only definite direct objects are used in the examples below. Possession is always expressed with a possessive pronoun suffixed to the head noun; if there is a possessive noun it precedes the head noun and stands in the genitive case (ending *-ın/-in/-un/-ün*), so that the possession is in effect marked twice, as in example (152) with a non-derived head noun.

(152)   Hasan-ın   kapı-sı
         Hasan-GEN door-his
         'Hasan's door'

In the action nominal noun phrase, there is assimilation to noun phrase syntax in so far as the subject of the sentence corresponds to a genitive attribute of an action nominal (with the appropriate possessive suffix on the action nominal); but sentence syntax is retained for the expression of the direct object, which remains in the absolute (indefinite) or accusative (definite) case; compare the sentences (153) and (155) with the corresponding nominalizations (154) and (156).

(153)   Hasan gel-di
         Hasan come-PST.3SG
         'Hasan came'

(154)   Hasan-ın   gel-me-si
         Hasan-GEN come-VN-his
         'Hasan's coming'

(155)   Hasan mektub-u yaz-dı
         Hasan letter-ACC write-PST.3SG
         'Hasan wrote the letter'

(156)   Hasan-ın   mektub-u yaz-ma-sı
         Hasan-GEN letter-ACC write-VN-his
         'Hasan's writing of the letter'

In (156) it would not be possible to have genitive *mektub-un*. This is so even if
the subject of the action nominal is not expressed, as in (157).

(157)   mektub-u yaz-ma
         letter-ACC write-VN
         'the writing of the letter'

It is impossible to say **mektub-un yax-ma(-sı)*; in (157) there is, of course, no
possessive suffix, given that the subject of the action nominal is completely
unexpressed. Thus Turkish has a quite general correspondence rule:
        subject of sentence = genitive of action nominal noun phrase, and
        direct object of sentence = direct object of action nominal noun phrase
    We may note in passing that a similar situation holds with the English gerun-
dive nominal: this typically has verbal syntax, but does allow (in certain styles,
require) noun phrase syntax in the expression of the subject, though not the
object, in the (Saxon) genitive, as in (158).

(158)   the enemy('s) destroying the city

    b. Classical Arabic. Classical Arabic provides a similar example of partly
nominal, partly verbal syntax in the action nominal. Subjects usually have the
nominative ending *-u(n)*, direct objects the accusative ending *-a(n)*. (The qual-
ification 'usually' is because of certain morphologically irregular or otherwise
defective types.) Genitives take the ending *-i(n)* and invariably immediately
follow their head noun; when there is a following genitive, the definite article
al- on the head noun is absent, although the noun is semantically definite, as
seen in (159–60).

(159)   al-xubzu
         the-bread

(160)   xubz-u   zayd-in
         bread-NOM Zaid-GEN
         'Zaid's bread'

    With the action nominal, it is in principle possible (unlike Turkish) for both
subjects and direct objects to stand in the genitive (though not both simultane-
ously), so that one can have ambiguous action nominals such as (161).

(161)   qatl-u   zayd-in
         killing-NOM Zaid-GEN

Example (161) can mean either 'Zaid's killing (of someone)' or '(someone's) killing of Zaid'. Where both subject and direct object of the action nominal are present (and only here), assimilation to noun phrase syntax is only partial, as in Turkish: the subject stands in the genitive, the direct object remains in the accusative; compare the sentence (162) and the derived nominal (163).[4]

(162)   Qatala zayd-un   muḥammad-an
         killed Zaid-NOM Muhammad-ACC
         'Zaid killed Muhammad'

(163)   qatl-u   zayd-in   muḥammad-an
         killing-NOM Zaid-GEN   Muhammad-ACC
         'Zaid's killing of Muhammad'

In Classical Arabic, then, assimilation to noun phrase syntax, with respect to subjects and direct objects, is taken as far as possible: if there is only one such adjunct, it appears in the genitive. If there is more than one, they cannot all appear in the genitive, given the requirement that a given head noun can have only one (immediately following) genitive, and in such instances all but one of the adjuncts simply remain in the form consonant with sentence syntax.

c. Written Modern Hebrew. Written Modern Hebrew is similar to Classical Arabic in the partial assimilation of its action nominal to noun phrase syntax, but with one interesting complication: there are, not one, but three genitive constructions in the language. These may be schematized as follows:

(164)   a. The 'bound' genitive ('construct'):
            N_x N_y
            zkan   ha-iš
            beard   the-man

         b. The *šel* genitive
            N_x šel N_y
            ha-sakan   šel ha-iš
            the-beard   of   the-man

---

[4] Certain other marginal possibilities are found in Classical Arabic, and noted by Wright (1898, II, 58–9), for example *qatlu muḥammad-in zayd-un* 'Zaid's murder of Muhammad', with retention of the nominative subject rather than of the accusative direct object. Note that this example is a counterexample to a strict interpretation of the hierarchy whereby subjects of nominalizations are more likely to show nominal features than are direct objects.

    c. The 'double' genitive
       N_x-POSSPRO šel N_y
       zkan-o   šel ha-iš
       beard-his   of the-man
       'the beard of the man'

The action nominal is similar to a simple noun phrase in its ability to occur with determiners, adjectives, and relative clauses. Example (165), from Gordon (1977), illustrates all three of these noun phrase concomitants.

(165)   ha-harisa   ha-gdola šel ha-ir   še   buca
        the-destruction the-big   of   the-city REL was.performed
          in.the.year   the-last
          bašana   še-avra
        'the big destruction of the city that was carried out last year'

The action nominal is also exactly like a simple noun phrase in that it can occur with either the subject or object in any of the three genitive constructions, as illustrated in examples (166–7) (from Berman (1976: 70ff.)):

(166)   subjective genitive
      a. knisat   ha-yeled
         entrance the-boy

      b. ha-knisa šel ha-yeled
         entrance of   the-boy

      c. knisat-o   šel ha-yeled
         entrance-his of   the-boy
         'the entrance of the boy'

(167)   objective genitive
      a. bitul   ha-xoq
         cancellation the-law

      b. ha-bitul   šel ha-xoq
         the-cancellation of   the-law

      c. bitul-o   šel ha-xoq
         cancellation-its of   the-law
         'the cancellation of the law'

Moreover, if *both* subject and object are present, *either* one may play the role of N in any of the three types of genitive (Berman, (1976:71)). However, in this case, as in Turkish and Classical Arabic, assimilation to noun phrase syntax is only partial: the participant which is *not* in the genitive relationship to the head noun must be marked by means of sentential markers, the accusative *et* for the

object in (168) and ***al ydey*** 'by' (the marker of the passive agent) for the subject in (169):

(168)   a. dxiyat   dan et   ha-hacaa
          rejection Dan ACC the-offer

        b. ha-dxiya   šel dan et   ha-hacaa
          the-rejection of Dan ACC the-offer

        c. dxiyat-o   šel dan et   ha-hacaa
          rejection-his of Dan ACC the-offer
          'Dan's rejection of the offer'

(169)   a. dxiyat   ha-hacaa al ydey dan
          rejection the-offer by   Dan

        b. ha-dxiya   šel ha-hacaa al ydey dan
          the-rejection of the-offer by   Dan

        c. dxiyat-a   šel ha-hacaa al ydey dan
          rejection-its of the-offer by   Dan
          'Dan's rejection of the offer'

For extensive discussion, see Berman (1976) and Gordon (1977).

    d. Maori. In the languages we have considered so far that have an overt distinction correlating with that between subjective and objective genitives, the overt distinction has been primarily syntactic, i.e. an existing syntactic distinction (prenominal versus postnominal genitive in English, adjectival versus genitival attribute in Czech) is utilized to make a distinction between subject and object. Another possibility is for an existing semantic distinction to be used to this end, as for instance in Maori (examples adapted from Biggs (1969):43–5)).

    We may start by presenting the general structure of the Maori action nominal, in its relation to active and passive sentences such as (170–1).

(170)   Ka patu te tangata i   te   wheke
           PCL kill the man   ACC the octopus
           'The man killed the octopus'

(171)   Ka patu-a   te   wheke e te   tangata
           PCL kill.PASS the octopus by the man
           'The octopus was killed by the man'

(Note that the usual word order in Maori is for a sentence-initial verb to be immediately followed by the subject.) The action nominal *patunga*, like English *killing*, does not overtly distinguish voice. In the action nominal construction, the subject (and only the subject) appears in the genitive, with the preposition *a* or *o*; the direct object remains with *i*, the passive agent with *e* (cf. section 2.1.1.1.3), as in (172–3).

(172)   te   patu-nga a te   tangata i   te   wheke
        the kill-vn   of the man   acc the octopus
        'the man's killing of the octopus'

(173)   te   patu-nga o te   wheke e   te   tangata
        the kill-vn   of the octopus by the man
        'the killing of the octopus by the man'

The important thing to note is that in (172) the genitive is constructed with *a*, whereas in (173) it is constructed with *o*. Quite generally, in Maori, there is a semantic distinction between genitives with *a* and those with *o*, whereby the former indicates a more active relation of the possessor toward the possessed, while *o* indicates a more passive relation. For instance, 'the man's book' is *te pukapuka a te tangata* (the man can carry the book), but 'the man's canoe' is *te waka o te tangata* (the canoe can carry the man). An example closer to an action nominal would be the opposition between *te waiata a te tangata* 'the man's song' (i.e. the song that he composed) and *te waiata o te tangata* 'the song about the man'. This same opposition is maintained with action nominals: if a noun phrase is semantically a subjective genitive, it takes *a*, as in (172); if it is semantically an objective genitive, it takes *o*, as in (173).

The *a/o* opposition in Maori is semantic rather than syntactic. In particular, the *a* and *o* genitives do not have distinct syntactic positions, so that we cannot have a single head noun qualified by both an *a* and an *o* genitive, i.e. (174) is impossible.

(174)   *te patu-nga a te   tangata o te   wheke
        the kill-vn   of the man   of the octopus

Moreover, in the action nominal both the *a* and *o* genitives correspond to a (surface) syntactic subject, *a* of an active sentence, *o* of a passive sentence; there is no direct relation between syntactic direct object and *o* genitive. For these reasons, we say that Maori makes use of a semantic, rather than a syntactic, distinction in correlation with the subjective/objective genitive distinction.

2.1.2.1.4   Unexpressed subjects

In apparently all languages with action nominalizations, it is possible to leave the subject unexpressed, the nominalization then referring to an abstract type of activity or state, as in English (175).

(175)   a. Swimming is good exercise
        b. Lying on the grass is forbidden
        c. Criticism is hard to take

In some languages, however, the nominalization takes a different form when the subject is expressed from when it is not. In Tagalog, for example, nominalizing the 'basic' (i.e. aspectless) form of a verb yields an abstract noun that cannot be particularized with an expressed subject, as in (175).

(176)   a. Madali-ng   magsasalita
             easy-LINK   speak.BASIC
             'Speaking is easy'

         b. *Madali-ng   magsasalita   niya / ni Pedro
             easy-LINK   speak.BASIC   his / of Pedro
             'His/Pedro's speaking is easy'

2.1.2.1.5   Idiosyncrasies in valency of action nominals

So far, we have been assuming that all syntactic derivations of action nominals can be accounted for in terms of either the syntactic properties of the corresponding sentence, or the internal syntactic or semantic properties of the noun phrase in the language in question. Moreover, we have illustrated the successful application of this principle in a large number of instances in a wide range of language types. For completeness, however, we must also note some instances where the syntax of the action nominal differs from that of both sentence and noun phrase. At the moment, these seem simply to be exceptions to the general principle; in some instances partial explanations may be forthcoming, though a fuller integration of most of these examples into our general account is a task for future research.

   In the languages we examined above, the expression of the agent with a 'passive' action nominal was essentially the same as that of the agent with a passive verb. Compare, for example, *the destruction of the city by the enemy* with *the city was destroyed by the enemy*, both with *by the enemy*; although even in English the parallelism is not complete: for example alongside *a march by 2,000 soldiers* there is no **it was marched by 2,000 soldiers*. In some languages, the expression of the passive agent is regularly different with a verbal noun from its expression in a sentence, without there being any reason internal to the syntax of other noun phrases for this discrepancy. In Italian, for instance, passive agents of verbs take the preposition *da* 'from, by', as in (177).

(177)   La città fu distrutta da-l nemico
         'The city was destroyed by the enemy'

With the verbal noun, ***da*** on its own is impossible; instead one must use *da parte di*, literally 'from [the] part of', as in (178).

(178)   la distruzzione della città da parte de-l nemico / *da-l nemico
         'the destruction of the city by the enemy'

(With the sentence, one can also say *La città fu distrutta da parte del nemico*, though the shorter version of (177) above is much more usual.) It is difficult to think of any good reason for this discrepancy: perhaps a more explicit coding of the agent is preferred in the more contracted expression of the action nominal, but at present this is purely speculative.

In German, the passive agent of a verb takes the preposition *von* 'by, of', whereas either *von* or *durch* 'through' is used with passive agents that are not strictly agentive (i.e., in particular, that are not animate, though are still not explicitly instrumental, for which the correct preposition in both active and passive sentences is *mit* 'with'); compare (179)–(182).

(179)   Das Haus wurde vom Feind zerstört [*vom = von dem*]
          'The house was destroyed by the enemy'

(180)   Das Haus wurde von/durch Bomben zerstört
          'The house was destroyed by bombs'

(181)   Der Feind hat das Haus mit Bomben zerstört
          'The enemy destroyed the house with bombs'

(182)   Das Haus wurde vom Feind mit Bomben zerstört
          'The house was destroyed with bombs by the enemy'

With the verbal noun, the passive agent can only be expressed by *durch* (*mit* is, of course, retained for explicit instruments), although in sentence syntax *durch* is impossible for strictly agentive agents; compare (183) and (184).

(183)   die Zerstörung des Hauses durch den Feind / *vom Feind
          'the destruction of the house by the enemy'

(184)   Das Haus wurde vom Feind / *durch den Feind zerstört
          'The house was destroyed by the enemy'

Again, we are unable to give a complete explanation for this discrepancy, though it is possible that the reason lies in the large number of other functions that the preposition *von* has in noun phrases: in particular, it expresses the genitival relation (in the written language, only with certain morphologically definable noun phrases; in the spoken language much more generally). Since the agent construction with the 'passive' action nominal serves, to some extent, to remove the homonymy inherent in the existence of both subjective and objective genitives, this function would simply be nullified if the passive agent were constructed in the same way, as can be seen in (185–7).

(185)   die Zerstörung von Städten
          'the destruction of cities'

(186)   *die Zerstörung von Städten vom Feind
         'the destruction of cities by the enemy'

(The noun phrase in (186) is, of course, possible, at least in colloquial language,
in the meaning 'the destruction of the enemy's cities'; since *der Feind* 'the
enemy' has a morphologically explicit genitive, the written language would
prefer in this sense *die Zerstörung von Städten des Feindes*.)

(187)   die Zerstörung von Städten durch den Feind
         'the destruction of cities by the enemy'

As a last example, we may note the discrepancy between expressions of the
passive agent with verbs and with action nominals in Welsh. The passive agent
with verbs requires the preposition *gan* 'by, with', and *o* 'from' is not possible,
as in (188).

(188)   Gwerthwyd y   ceffyl gan y   ffermwr
         sold.PASS   the horse by the farmer
         'The horse was sold by the farmer'

With verbal nouns, however, one must use *o*, not *gan*, as in (189).

(189)   gwrthodiad y   cynnig o   'r gweiniog
         rejection   the offer from the minister
         'the rejection of the offer by the minister'

The only available explanation here seems to be historical: *gan* has, over the
history of Welsh, replaced *o* in many of its uses (apart from locative 'from' and
partitive 'of'), so that, for instance, Modern Welsh has *gan* for instruments, as
in (190), where Middle Welsh has *o*, as in (191) (D. S. Evans (1970:204)).

(190)   Lladdodd ef y   ddraig gan fwyall
         killed   he the dragon with axe
         'He killed the dragon with an axe'

(191)   y drychu y Freinc   llurugauc a   helmauc o   'e
         to cleave the Frenchman armored   and helmeted with his
           uwyall deu vinyauc
           axe   two edged
         'to cleave the armoured and helmeted Frenchman with his
         double-edged axe'

Perhaps, then, the use of *o* in action nominals is a relic of the earlier more
extensive use of *o*, in verbal constructions too.

A further set of instances where action nominal syntax deviates from both
verbal and nominal syntax concerns 'irregular' syntactic expression of the

object of an action nominal. As we saw in our discussion on valency in section 2.1.2.1, the expected situation is for an action nominal to take the same case/preposition/postposition as the verb to which it is derivationally related, unless there is a general rule in the language specifying that a certain type of verbal object regularly corresponds to a different kind of nominal adjunct (in particular, in many languages, direct objects of verbs correspond to adnominal genitives in action nominal noun phrases). In many languages, however, we find that some action nominals obligatorily or optionally take a different object from the corresponding verb, without there being any regular principle like the direct object / adnominal genitive correspondence. In German, for instance, the verbs *lieben* 'love' and *hassen* 'hate' take a direct object (accusative case), whereas the action nominal *Liebe* 'love' requires the preposition *zu* 'to(wards)' and *Hass* 'hate' requires *gegen* 'against', as in (192–195).

(192)   Peter liebt die Königin
         'Peter loves the Queen'

(193)   Peters Liebe zur Königin [*zur = zu der*]
         'Peter's love of/for the Queen'

(In English, the nominal *love* may either retain the genitive, corresponding to a direct object, or take the preposition *for*; in German the former possibility is excluded, i.e. not *Peters Liebe der Königin*.)

(194)   Peter hasst den König
         'Peter hates the King'

(195)   Peters Hass gegen den König
         'Peter's hatred of the King'

Similar instances can be found in Russian, for example *ljubit´* + accusative 'to love', *ljubov´k* 'love (lit.: toward)'; *nenavidet´* + accusative 'to hate', *nenavist´k* 'hatred (toward)'; *udivljat´sja* + dative 'to be surprised at', *udivlenie* + dative/*k*/*nad* 'surprise at' (with dative/'to'/'over'), as in (196–201).

(196)   Andrej ljubit caricu
         'Andrey loves the Tsarina'

(197)   ljubov´ Andreja k carice
         'Andrey's love of/for the Tsarina'

(198)   Andrej nenavidit carja
         'Andrey hates the Tsar'

(199)   nenavist´ Andreja k carju
         'Andrey's hatred of the Tsar'

(200)   Andrej udivilsja ee kostjumu (DAT)
        'Andrey was surprised at her suit'

(201)   udivlenie Andreja ee kostjumu / k ee kostjumu / nad ee kostjumom
        'Andrey's surprise at her suit'

In certain instances the lack of correspondence between the verbal and action nominal object seems to be purely idiosyncratic, a lexically conditioned irregularity. In many instances, however, the exceptional verbs do fall into a semantic class: for instance, Russian action nominals which exceptionally take *k* 'to(ward)' are nearly all psychological predicates, verbs expressing someone's attitude toward something. The same is true of the German examples, except that here the kind of attitude is made more explicit, with *zu* 'to(ward)' for positive feelings and *gegen* 'against' for negative feelings. Thus there are at least sub-regularities here. Typically, such instances involve giving more explicit reference to the kind of semantic relation obtaining between the action nominal (and also the verb) and its object: compare the suggestion above that there may be some tendency toward more explicit marking of the underlying subject in the action nominal construction.

Another piece of evidence pointing in the same direction concerns German action nominals corresponding to verbs that take a genitive or dative object, for example *gedenken* + genitive 'commemorate', *danken* + dative 'thank', *widerstehen* + dative 'resist'. As noted above, action nominals are not permitted to take a genitive or dative object in German (except, of course, for the objective genitive corresponding to the accusative object of a verb). Where a verb takes such an object and has a derived action nominal, that action nominal usually takes a prepositional phrase: there seems to be no general rule for predicting which prepositional phrase, though the preposition is usually one that makes the relation of object to action nominal more explicit semantically, for example *Dank an* 'thanks to', *Gedenken an* 'remembrance of (lit.: to)', *Widerstand gegen* 'resistance against'; examples are (202–7).

(202)   Die Soldaten widerstehen dem Feind (DAT)
        'The soldiers resist the enemy'

(203)   der Widerstand (der Soldaten) gegen den Feind
        'the (soldiers') resistance to the enemy'

(204)   Der Mann dankt einem Freund (DAT)
        'The man thanks a friend'

(205)   der Dank (des Mannes) an einen Freund
        'the (man's) thanks to a friend'

(206)   Das Volk gedenkt der Toten (GEN)
         'The people commemorate the dead'

(207)   das Gedenken (des Volkes) an die Toten
         'the (people's) remembrance of the dead'

2.1.2.2 Adverbs and adjectives.   Another difference between the syntactic combinations entered into by verbs and by nouns is that the former are normally qualified by adverbs, the latter by adjectives. As far as action nominals are concerned, the difference is particularly clear with manner adverbials: whereas verbs take manner adverbials, in many languages action nominals require the corresponding adjective, as in English examples (208–9).

(208)   The enemy rapidly destroyed the city

(209)   the enemy's rapid destruction of the city

The same situation obtains in the Russian translation of these, given in (210–11).

(210)   Vrag bystro razrušil gorod

(211)   bystroe razrušenie goroda vragom
         'the rapid destruction of the city by the enemy'

However, the intermediate position of action nominals between verbs and nouns can be seen from the fact that in some languages both adverbials and adjectivals can be used in such constructions, as in the examples (212–13) from Colloquial Egyptian Arabic (Wise (1975:79–80)):

(212)   mašy-ak   bisur'a
         walking-your quickly

(213)   mašy-ak   is-sarii'
         walking-your the-rapid
         'your walking quickly'

In Polish, although the basic construction is for action nominals to take adjectives, examples with adverbs are often fully acceptable to native speakers, probably because Polish action nominals, unlike those in Russian and Czech (see section 2.1.2.1.2), retain relatively many verbal categories. An example is (214).

(214)   Konspiracja polega na chodzeniu cicho
         'The conspiracy depends on walking quietly'

Even in English, many native speakers find such constructions with manner adverbials – such as (215) – tolerable, though clearly less preferable to versions with the corresponding adjective:

(215)   ?the enemy's destruction of the city rapidly

Other languages are even less tolerant, so that in Russian for instance it is quite impossible to use an adverb in (216).

(216)   *razrušenie bystro   goroda vragom
         destruction rapidly of.city by.enemy

With other kinds of adverbials, where the morphological relation to corresponding adjectives is usually much less consistent or even non-existent, languages seem to be more tolerant of adverbs qualifying action nominals, as with English (217).

(217)   his departure tomorrow

(218)   ego ot″ezd zavtra (Russian)

(219)   safar-u bukra (Colloquial Egyptian Arabic)

Even here, however, there are language-particular restrictions, which seem not to have been well studied to date; for example there is a difference between Colloquial Egyptian Arabic and Russian, seen in the contrast between (220) and (221).

(220)   tamalli tašǧiil-ak   li-r-radiu (Colloquial Egyptian Arabic)
         always playing-your DO-the-radio
         'your always playing the radio'

(221)   *tvoe čtenie   vsegda takix   knig (Russian)
         your   reading always of.such books
         'your always reading such books'

The only grammatical equivalent in Russian would be with an adjective, such as *postojannoe* 'perpetual', i.e.

(222)   tvoe postojannoe čtenie   takix   knig
         your perpetual   reading of.such books

    The possibility of adverbials qualifying action nominals is most widespread when the action nominal is taken in its basic sense of describing a fact or action, and is much less, if at all, possible when the action nominal has a more concrete meaning. In the English examples (223–6), for instance, the adverbials are much more natural with *criticism* in the sense of 'the fact that X criticized Y', than in the sense 'a piece of critical writing':

(223)   John's criticism of Bill, sarcastically, surprised all those present

(224)   ?*John's criticism of Bill, sarcastically, appears on page 26

(Note that, even so, the adverb is reasonably natural only if separated by pauses.)

(225)   John's criticism of the book before he had even read it was unfair.

(226)   ?*John's criticism of the book before he had even read it appears on page 26.

(Compare Chomsky (1970:193–4).)

On the basis of the discussion in section 2.1, one could establish a hierarchy of which verbal and nominal categories are more or less likely to be present in nominalizations, an enterprise taken further in Malchukov (2004). Thus, subjects are more likely to be assimilated to nominal syntax than are direct objects. Mood is more likely to be lost than tense, which is in turn more likely to be lost than is aspect.

2.2   *Nominalizations with no lexically derived noun*

We have discussed at some length the 'action nominal', whose head is a lexically derived noun. In languages that have morphological nominalization processes for creating lexical action/state nouns from verbs, there will typically be an action nominal construction with the properties we have described. However, some languages have no such morphological processes, and yet clauses can be nominalized and used in various nominal constructions. Other languages may have a process creating action/state nouns, and a separate, unrelated process for nominalizing clauses. For convenience, we will refer to this type of nominalization as 'clausal nominalization'. The characteristic feature of this type of nominalization is that there is no evidence in favour of viewing its head as a lexical noun. That is, the verb in such a clause typically has no nominal characteristics and often has such verbal characteristics as person and number, though it may be lacking in tense–aspect marking.

A good example of such a language is Mojave, a Yuman language of Arizona and California. Mojave has no action nominal construction, but it does have nominalized clauses. The verb in the nominalized clause differs from that in the corresponding simple sentence in that: (i) it appears in a (non-regular) different form; and (ii) the otherwise obligatory tense marker is absent, as can be seen in (227).

(227)   a. Simple sentence
            ʔinʸeč ʔakor ʔ-isvaːr-k
            I   then   I-sing-TNS
            'I sang then'

        b. Nominalized clause functioning as subject
            ʔinyep ʔakor ʔ-suːvaːr-č ʔatay-pč
            me   then   I-sing-NOM much-TNS
            'My former singing was considerable (= I used to sing a lot)'

Comparison of the nominalized clause, underlined in (227b), with the simple sentence in (227a) reveals that, in addition to the fact that the verb stem has a different shape and lacks tense marking, the subject of the clause appears in the accusative case, the first person marker ʔ- is still present, and a subject case marker is suffixed to the last element in the nominalization since it is functioning as the subject of ʔatay- 'much'. Thus, there are two important respects in which the 'clausal nominalization' exhibited in Mojave does not parallel the 'action nominalization' examined in the preceding section: (i) the subject of the Mojave nominalized clause appears not in a genitive or other oblique case but in the accusative case; (ii) the verbal category of 'person' is marked on the nominalized clause just as it is on the verb of a simple sentence. These two properties suggest that it is more appropriate in Mojave to view clauses as undergoing certain modifications which allow them to function as noun phrases rather than to think of the verb itself as having become a noun in such nominalizations. For an extensive discussion of nominalization in Mojave, see Munro (1976).

Clausal nominalization in Lakhota is accomplished by suffixing the article to a sentence. Thus compare the sentence in (228a) with its nominalized form in (228b) (Buechel (1939:314)):

(228)   a. Unglapi
           'We are going home'

       b. Unglapi   kin iyonicipʻipi
          we.are.going.home the has.pleased.you
          'Our going home has pleased you'

Here again, there is nothing noun-like about the verb in this nominalized clause; it undergoes no change whatsoever from its form in a finite sentence, and the nominalization is accomplished solely by the definite article.

Ancient Greek is similar. Thus, the noun phrase (229) is formed by adding the singular neuter definite article *tò* to the imperative *gnỗthi seautón* 'know yourself'.

(229)   tò   gnỗthi   seauton
        the knowledge yourself
        'self-knowledge'

2.3   *Functions of nominalizations*

It is commonplace that a nominalization can occur wherever a noun phrase is called for. Thus, it is most natural for nominalizations to occur as subjects or objects of sentences or as objects of prepositions. Examples from English would be as in (230).

(230) a. Subject
           His drinking too much worried us

       b. Object
           We didn't like ***his drinking too much***

       c. Object of preposition
           We were sorry about ***his drinking too much***

Nominalizations also often function in adverbial clauses together with a subordinating connector. For example Luiseño, a Uto-Aztecan language, has such a strategy, at least for conditionals, where *-qala* is a general subordinating morpheme (see Davis (1973)), as illustrated in (231).

(231) ʔári-up   póy   ***ʔoy***   ***pu-ʔari-qala***
       kick-IMP   he.ACC   you.ACC   3.GEN-kick-SUBORD
       'Kick him if he kicks you'

Luiseño also exhibits a somewhat more rare function of nominalization: as a relative clause modifying a head noun (cf. also (14) above). A good example of this function is sentence (232) (Davis (1973:211)):

(232) Kiʔál-up   niveʔ-qa   wíw   ŋa   *nu-\$ŋaki pu-lóʔxa-ŋa*
       fly-PRS   be.in-PRS   acorn.mush LOC   my-wife 3.GEN-make-LOC
       'There's a fly in the acorn mush that my wife made'

There are two things to note about this sentence. First, there is a head noun in this construction, *wíw* 'acorn mush', whose role as a locative phrase in the main clause is clearly signalled by its locative suffix. Second, the italicized nominalization can be seen to be structurally identical to that in the preceding sentence, (231); evidence that it is a nominalization comes from (i) the possessive prefix *pu-*, characteristic only of nouns, and (ii) the locative case marker. In fact if the head noun were plural, the nominalization would be marked for plurality as well. Thus, although this is not the only type of relative clause possible in Luiseño, it provides a clear case of a nominalization functioning as a relative clause.

It is not difficult to understand how a nominalization can function as a relative clause: the nominalization and the noun with which it is in construction can be thought of as two juxtaposed nominal elements [NOM] [NOM], the modifying relationship between them being inferred by the language users (rather than being specified by the grammar, as it is in languages with specific relative clause morphology), just as the modifying relationship is inferred in a noun–noun compound such as *tree-house*, in which the two nominal elements simply happen to be single nouns.

An even more extreme example of the function of nominalization in relative clause formation is provided by a language in which relativization is not

structurally distinct from nominalization. A number of languages of the west and southwest of the USA are of this type (for extensive discussion, see Fauconnier (1971); Gorbet (1974); Munro (1976); and C. Li and Thompson (1978)), as well as Quechua, spoken in Peru (see Weber (1978)). Thus, in Diegueño, a Yuman language (see Gorbet (1974)), for example, both relative clauses and nominalizations are of the form shown in (233).

(233) $_{NP}$[. . .v] – (DEM) – case

That is, in these languages, in which there is no structural head noun, it may not be possible to distinguish a relative clause from a nominalization on the basis of their form alone. This time, which noun is to be interpreted as the head noun is what must be inferred. Thus, consider the Diegueño relative clause and sentential object sentences in (234).

(234)   a. *Relative clause*
              [i:pac   '-wu:w]-pu-c   ciyaw
              man   I saw-DEM-NOM sing
              'The man that I saw sang'

           b. *Object clause*
              'nya:-c '-i:ca-s   *[puy ta-'-ny-way]-pu-ɸ*
              I-NOM   I-remember-EMPH there PROG-I-be-there-DEM-OBJ
              'I remember that we were there'

Note that the demonstrative and case suffixes which mark clauses as being nominalized in this language are found on the italicized clauses in both (234a) and (234b), and there is no other formal difference between them. Hence our claim that in certain languages relativization is indistinct from nominalization.

3   Devices for forming nouns from nouns

We have so far been talking exclusively of nouns and noun phrases that are related to verbs or adjectives and to entire sentences. Are there any other sources for creating nouns and noun phrases in languages? Below, we briefly give a few examples of the process of deriving nouns from other nouns.

3.1   Abstract nouns

In some languages, abstract nouns can be formed from more concrete ones. In Si-Luyana, for example, the prefix *u-*, which is the class prefix for the 'mass noun' class 14, can be added to human noun stems to form abstract nouns meaning 'the quality of being N' (Givón (1970a:79–80)), as in (235):

(235)   a. -nu   ⇒ u-nu
            person   humanity

        b. -ana   ⇒ u-ana
            child   childishness/childhood

        c. -lume   ⇒ u-lume
            male   virility/manhood

In English, serving this function are the Germanic suffixes *-dom*, as in *king-dom*, *-hood*, as in *childhood*, and *-ship*, as in *friendship*.

3.2   *Concrete nouns: augmentative/pejorative/diminutive*

Some languages allow nouns to be derived from other nouns where the new form denotes a larger, smaller, or less desirable version of the referent of the stem. Again, Si-Luyana is a rich source of examples (Givón (1970b:79–80)).

(236)   a. si-fuba ⇒ ka-fuba
            bone   small bone

        b. li-muna ⇒ ka-muna
            leaf   small leaf

(237)   a. n-de   ⇒ n-de-ana
            lion   lion-child = lion cub

        b. ka-bili ⇒ ka-bili-ana
            hill   hill-child = little hill

(238)   a. mw-ana   ⇒ si-ana
            child   big/ungainly/naughty child

        b. mu-tondo ⇒ si-tondo
            tree   big/ugly/useless tree

Reduplication is a process that, in language after language, is used to derive forms meaning diminution. Thus, in Nez Perce, for example, we find (239).

(239)   a. té · mul ⇒ temulté · mul
            hail   sleet

        b. xóyamac ⇒ xoyamacxóyamac
            child   small child

(For more discussion of reduplication, see Moravcsik (1978).)

In Sundanese, reduplication of just the initial syllable of a noun plus the suffix *-an* results in forms meaning 'toy or false "noun"' (Robins (1959:360)):

(240)   a. mobil ⇉ momobilan
             car   toy car

          b. panon ⇉ papanonan
             eye   glass eye

          c. imah ⇉ iimahan
             house   toy house / doll house

4   Summary

In this chapter we have discussed and illustrated the types of processes which languages have for creating nouns from verbs and adjectives and for forming noun phrases from entire propositions. The generalizations which we have arrived at can be summarized as follows.

1. Nouns can be formed from verbs and adjectives to designate either the name of an activity/state or the name of one of the arguments of that verb/adjective.
2. Nouns can also be derived from other nouns, but not from other categories.
3. Processes for forming nouns are likely to be non-productive and to involve a great deal of irregularity and unpredictability.
4. Languages differ as to whether their action nominals more closely resemble noun phrases or sentences in terms of the following parameters:
    (a) the number of verbal versus nominal categories shown by the head noun of the action nominal;
    (b) whether the nouns functioning as subject and object of the corresponding sentence are marked as genitive or oblique (i.e. more nominal) or with the case forms they would have in a full sentence (i.e. more verbal);
    (c) whether the adverb in the corresponding sentence appears as an adverb (i.e. more verbal) or as an adjective (i.e. more nominal).
5. In some languages derived noun phrases cannot be analysed as having head nouns.

5   Suggestions for further reading

The major monographic study of action nominals is Koptjevskaja-Tamm (1993). Reference should also be made to Koptjevskaja-Tamm (2005) for the geographical distribution of different types.

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