

# Complexity in nouns

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Complex nouns exist in both polysynthetic and non-polysynthetic languages. They are formed *ad hoc* on the basis of non-root bound morphemes and/or root concatenation and thus integrate relational, modificational, classificatory, locational, modal and focus information and even up to interrogatives, numerals and proper names. Internal organization and evolutionary types of these nouns do not correlate with polysynthesis, either.

## 1. *Complex nouns*

The structure of noun forms and their potential complexity have not been studied extensively to date. Verbal complexity, on the other hand, has been approached under the term polysynthesis (see below). Although nominal complexity is independent of the morphological type of a language in principle, it is most common in polysynthetic languages, e.g. Chukchi, Ainu, Ket, Lakhota, Nez Perce, Greenlandic, Tunica, but also found in non-polysynthetic languages like Yamphu, Sanskrit and German or in the arguably (pre-)polysynthetic language Nivkh. It presupposes, of course, the existence of an independently definable lexical category of nouns in the language in question (by their inflectional and derivational potential and their distribution, cf. Sasse 1993), not translation equivalents of European nouns.

Noun forms may become structurally complex in several ways: by way of agglutinative inflection, as the result of lexicon-enlarging word formation, and as the result of *ad hoc* word formation, which lies somewhere in-between the above two. It is the latter we are concerned with here, viz. we will deal with

- *ad hoc* formed complex forms
- of nouns
- which constitute single word units (as definable in the language in question, see section 1).

*Ad hoc* formation (dealt with in section 2) is productive and as free as phrase or clause formation, yielding compact paradigmatic forms with transparent semantics (rather near the “sum of its parts” end). It differs from simple agglutinative inflection in the variety of categories beyond gender, number, case, definiteness and possessor encoded by non-root bound morphemes (see below) and/or in root concatenation.

Complex nouns will be studied comparatively in polysynthetic and non-polysynthetic languages here with respect to

- their structural types (affixal vs. compositional, sections 3.1 and 3.3),
- their semantic and formal components (sections 3.2 and 3.4),
- their internal organization (section 4),
- and their evolutionary types (section 5).

A language is acknowledged to be polysynthetic because of

- (i) the existence of complex, polymorphemic verb forms which allow, within one word unit, for components in the form of non-root bound morphemes with quite ‘lexical’ meaning or optionally for the concatenation of lexical roots;
- (ii) these components express several of the following categories: event or participant classification and quantification, setting (e.g. ‘in the night’), location or direction, motion, instrument (e.g. ‘by hand’), manner (‘by pulling’, ‘quickly’), modality (including evidentiality), degree, scale (‘only’, ‘also’) and focus, chronology (e.g. ‘first’, ‘again’), as well as the usual categories such as valence, voice, central participants, tense, aspect (phase), mood, and polarity (Mattissen 2003, 2006).

“Non-root bound morphemes with quite lexical meaning” are understood to be affixes/clitics with meanings which would be expressed by independent forms, especially lexical roots, in more analytic languages, but which never make up free word forms in the languages concerned. To count as a root, a morpheme with lexical semantics must constitute a free word form on its own or in combination with inflectional affixes. So non-root bound morphemes are not roots synchronically. They may or may not change the lexical category of the root attached to. Because of their concrete meanings non-root bound morphemes are labeled “lexical”, “thematic” or “field-affixes” (in polysynthetic languages) or “semi-affixes” (in European languages) in the literature (for semantics see section 3.2).

## 2. Evidence of wordhood

The output of *ad hoc* formation is a single word. This is evident where morphemes with a bound only status are involved. In addition, morphophonological and morphosyntactic evidence and syntactic behaviour prove the wordhood.

In polysynthetic Chukchi, for instance, the noun complex is an accentual unit subject to vowel harmony, schwa epenthesis, and word-final vowel reduction (Spencer 1995: 445). It is also inflected as a whole, making use of circumfixes. In Ainu, final and initial sounds of adjacent morphemes in complex nouns undergo assimilation, dissimilation, hiatus-elimination, and there are traces of vowel harmony (Shibatani 1990: 74-75, 13). In Nivkh, noun complexes are accentual, pitch and pause units, with morphophonemic mechanisms, especially consonant alternation, active at morpheme boundaries (see Mattissen 2003). The complex *maṭkilk-tux-ñaqr-toyo*, the last item of the enumeration in (2), containing a modifier, head and classifier, is inflected for case as a whole, at its end, and permuted in a clause as a whole.

- (1) Chukchi (Spencer 1995: 479)  
ga-ṛoten-təlacʔə-ma  
COM-this-motor-COM  
'with this motor'
- (2) Nivkh (Panfilov 1962: 170)  
... puñd-royo q'aχ-toyo maṭkilk-tux-ñaqr-toyo ...  
bow-TERM spear-TERM small-hatchet-one\_CLF-TERM  
'up to a bow, a spear, and one small hatchet'

In Tunica (Haas 1941: 130), the noun complex is framed by an article prefix and a gender suffix, as in

- (3) Tunica (Haas 1941:130)  
ta'yorumʔaha-wi'rataha-si'nima  
ART-wild\_beast-fearful-non\_sg.f  
'some fearful wild beasts'

In non-polysynthetic German and Sanskrit, noun complexes (called 'compound phrases' in Sanskrit) are accentual units with a fixed internal order of dependent and head, inflected and permuted as

wholes in a clause, even if the Sanskrit forms may exhibit phoneme clusters otherwise disallowed word-internally at their morpheme boundaries (cf. (41), Whitney 1924: 480, Killingley & Killingley 1995: 44). Occasionally, they contain morphemes which cannot occur as free forms (cf. Whitney 1924: 483).

### 3. *Ad hoc* formation

*Ad hoc* formation is not necessarily different from lexicon-enlarging word formation in the actual mechanisms and processes involved (e.g. composition, derivation, affixation); its output, however, are paradigmatic forms, not lexicalized ones (although a form may enter the lexicon when its use spreads as a label). They may not be paraphrasable (as in Chukchi and Nivkh, see 3.4.1) or may be “abbreviating” phrasal or clausal constructions (as in German and Sanskrit).

A distinction between *ad hoc* and lexicalized formations is drawn in some grammars (e.g. Killingley & Killingley 1995: 43-44 for Sanskrit, Duden-Grammatik 1973: §1021 for German). Boas & Deloria (1979: 67, 69) distinguish two types of non-predicative expressions in Lakhota, each being formed from either two nouns, noun + ordinal number, or noun and stative verb. Both constructions are characterized by one primary accent, but whereas the one expresses a “unit concept” (lexicalised compound), in the other, one of the terms is “subordinate”, i.e. modifies, the other (Boas & Deloria 1979: 67; *ad hoc* formation). Note the original transcription with morpheme dashes.

(4) Lakhota (Boas & Deloria 1979: 67)

a. c'e'ga-t'a'ka ki he' ma-k'u' (ad hoc-formed)  
 kettle-big ART that 1sgU-give  
 'the large kettle, that (one) give me'

b. c'e'h-t'a'ka wo'-he? (lexicalised)  
 kettle-big food-cook  
 'she cooked a big kettle-full (for a feast)'

c. c'e'ga-zi kettle-yellow 'a yellow kettle' (ad hoc)

d. c'e'h-zi' kettle-yellow 'a brass kettle' (lexicalised)

For Cayuga, Sasse describes fully inflected predicative forms with a lexicalised meaning which are systematically ambiguous to

their paradigmatic source forms, which – identical in form – are still formed productively and *ad hoc* with their paradigmatic readings. The lexicalised forms exist alongside their sources with a specialised non-deducible meaning, mostly designating artefacts and animals (Sasse 1993: 207). In Cayuga, they are not nouns, however.

- (5) Cayuga (Sasse 1993:207)  
 kaʔtanɛ hkwiɥ a. 'it habitually carries logs' (not necessarily  
 a horse)  
 b. 'horse'  
 ehyátɔhkhwa' a. 'she/one writes with it'  
 b. 'pencil'

This ambiguity to productive forms is typical of polysynthetic languages, and also found in Nivkh:

- (6) Nivkh (Savel'eva & Taksami 1970: 241)  
 oɤla-gu-ler-f  
 child-PL-play-LOCAL.NML  
 a. 'place where children are playing' (literal, paradigmatic meaning)  
 b. 'children's playground' (lexicalised)

Such *ad hoc* formations may reach an impressive complexity, but are still recognized as single words by native speakers. They do not easily fit into linguistic theories, though. Can there be such a thing as *ad hoc* formation on the morphological level without lexicalization, reminiscent of a syntactic process? In any case, the pattern is not marginal as it may seem, as shown below. In German, the media and administrative language abound with such formations.

#### 4. Structural types

Complex noun forms may be of two fundamental structural types, affixal (see 3.1) or compositional (see 3.3; terms borrowed from lexical word formation). Their difference lies in the number of lexical roots allowed within one complex form: just one lexical noun root, which is derived with non-root bound morphemes only (affixal), or concatenation of more than one root (compositional) ± non-root bound morphemes.

#### 4.1. The affixal type

Greenlandic chains non-root bound morphemes (without a reconstructible relation to any lexical root, cf. Fortescue 1992: 245) on a single root in a fully productive way. There are two basic kinds of *ad hoc* formation. One is category changing, which usually occurs in a kind of ping pong pattern: a nominal root is verbalized, then renominialized and again reverbalized and so forth (cf. second word form in (7)), or a verb root nominalized, reverbalized, again renominialized etc. (cf. first word form in (7)). The language has about 90 verbalizers and 28 nominalizers at its disposition.

- (7) Greenlandic (Fortescue 1984: 68-69)  
 ilinnia-ruma-nngit-su-tut isuma-qar-vi-gi-niqar-put  
 study-DES-NEG-IP-EQU.PL thought-VBL:exist-LOCAL.NML-VBL:have\_as-PASS-IND:3pl  
 V N N V N V  
 ‘they were thought of as unwilling to study’

The other one does not change lexical category. There are about 70 modificational, non-obligatory grammatical suffixes in Greenlandic which attach productively to nominal roots (or nominalizers; cf. Fortescue 1980: 277-278, cf. 3.2 for examples), expressing:

1. alienability and mode of acquisition
2. relational derivation (a person or thing related to the N)
3. quantity (sociative, partitive)
4. property, temporality, similitude (*-usaaq* ‘like’)
5. focus and degree, e.g. *-innaq* ‘only’, *-ngajak* ‘almost’

- (8) Greenlandic (Fortescue 1984: 202, 31)  
 naja-nngua-n-nik  
 younger\_sister-little-P'OR:1sg-INS  
 ‘through my little sister’

Nez Perce has 23 prefixes and 56 suffixes marked on nouns (plus 18 case suffixes, mostly local concepts, see Aoki 1970: 56-65, 71-79). The prefixes and suffixes express possessive, caritive, quantificational, instrumental, qualitative, intensifying, and classificatory concepts; relations such as possessor, inhabitant, friend, ‘place for/of’, as well as deictic and focus elements.

- (9) Nez Perce (Aoki 1970: 61)  
 he-?inwí--m-cim distributive-year-a\_being\_from-only ‘only yearlings’

The affixal type seems to be reserved for polysynthetic languages, such as Klamath and Hupa.

#### 4.2. Semantic components

The semantic contribution of integrated components is generally independent of their morphological status (non-root bound morphemes or roots). Compare the use of a lexical root 'big' in German (non-polysynthetic) and Ainu (compositional) with non-root bound augmentative morphemes in Yamphu (non-polysynthetic), Greenlandic (affixal) and Tunica.

- (10) Ainu (Shibatani 1990: 74)
- |                             |                             |
|-----------------------------|-----------------------------|
| a. e-pon-no-poro-setaha     | b. pon-no poro e-setaha     |
| 2sg.P'OR-slight-ADV-big-dog | slight-ADV big 2sg.P'OR-dog |
| 'your slightly big dog'     | 'your slightly big dog'     |
- (11) German
- |                    |                                  |
|--------------------|----------------------------------|
| Groß.aufgebot      | 'large contingent' (e.g. police) |
| Groß.packung       | 'bulk pack'                      |
| Groß.demonstration | 'large-scale demonstration'      |
- (12) Yamphu (Rutgers 1998: 170)
- |  |             |                 |
|--|-------------|-----------------|
| wa-dhappa  | chicken-big | 'a big chicken' |
| (< <i>thappa</i> 'old man'; lexeme 'big' is <i>be?e-</i> ) |             |                 |
- (13) Greenlandic (Fortescue 1984: 31)
- |   |                            |
|---|----------------------------|
| siursus-suaq  | tassa kisi-mi              |
| rushing_sound-big   | that_is alone-P'OR:REFL.sg |
| 'a great rushing sound, that alone (was heard)' (root 'big' is <i>angi-</i> ) |                            |
- (14) Tunica (Haas 1941: 129)
- |  |  |
|--|--|
| ta'-heri-tʔε-sa'hú-hč                                  |  |
| ART-boat-AUG-other-f.sg                                |  |
| 'the other large boat' (lexeme 'big' is <i>ti'ka</i> ) |  |

The ontological domains represented by non-root bound morphemes on nouns in a sample of 75 languages (see Mattissen 2006) are classification, property, value, temporality, quantity, degree, location, modality, evidential, negation and interrogatives. In addition, there are the usual nominal categories of number, possession, case, focus or scale and referentiality status, plus nexus markers. These domains occur in various combinations.

(i) *Properties, value and temporals*

Diminutives and augmentatives, often combined with affectionate values ('dear', 'bad', pejorative) and time-related concepts (known as decessive, defunctive, discarded, future etc.) are most common. Greenlandic has, for instance, *-araq* 'small', *-kuluk* 'bad/small/dear', *-kasik* 'bad/poor', *-nnaq* 'main/favorite', *-vik* 'real', *-rluinnaq* 'complete', *-galuaq* 'former', *-tuqaq* 'old', *-ssaq* 'future' and *-taa*q 'new' (cf. Fortescue 1990: 331).

The top five world-wide, diminutive, augmentative, defunctive, similitive ('-like') and pejorative affixes, are also common in European and non-polysynthetic languages. In Nivkh, the whole domain is expressed by concatenating roots, in German, by non-root bound morphemes and root concatenation.

(15) Tubinambá (Jensen 1998: 511)  
i-mén-ám-wér      3-husband-future-former      'her ex-fiance'

(16) German  
mein    Lieblings-ex-Hauptstadt-Bewohner  
my      favourite-former-capital-resident  
'my favourite former resident of the capital / my favourite resident of the former capital'

The German complexes may be written in one word or with hyphens (making parsing easier). When hyphens are used, noun components are written with capital initials.

The table below gives an overview of the existence of the most common modificationals in some of the languages in our sample.

language \ category	1	2	3	4	5	6	7	8	9	10	11
Greenlandic (Eskimo; Fortescue 1980)	+	+	+	+	+	+	+	+	+	+	+
German (non-polysynthetic)	+	+	+	+	+			+	+	+	
Tupí (Tupí-Guaraní; Rodrigues 1999)	+	+	+	+		+	+		+		
Chukchi (Chukcho-Kamchadal; Kämpfe/Volodin 1995)	+	+	+	+		+	+		+		
Comanche (Uto-Aztecan; Charney 1993)	+	+	+	+	+	+				+	
Yamphu (Kiranti; Rutgers 1998; non-polysynthetic)	+	+	+	+					+		+
Hupa (Athapaskan; Goddard 1911)	+	+	+	+			+				
Lakhota (Siouan; Boas & Deloria 1979)	+	+		+		+					+
Sierra Miwok (Miwokan; Broadbent 1964)	+	+	+				+				
Kayardild (Pama-Nyungan; Evans 1995)	+	+	+					+			
Sarcee (Athapaskan; Cook 1984)	+	+	(+)			+					
Yagua (Peba-Yaguan; Payne & Payne 1990)	+	+			+						
Warekena (Arawak; Aikhenvald 1998)	+				+			+			
Klamath (Barker 1964)	+	+		+							
Tariana (North Arawak; Aikhenvald 1999)	+				+						+
Tunica (Gulf; Haas 1941: 75)	+	+									

Legend:

1	'small', diminutive	6	'genuine'
2	'big', augmentative	7	'future', 'material for'
3	'former', 'ex-', 'old'	8	'dear', 'good'
4	'-like', similative	9	'entire'
5	'bad', pejorative	10	'new'
		11	'more or less', approximative

Temporal modificationals (categories 3, 7, 10) also exist in Uto-Aztecan languages.

(ii) *Classifiers*

Classifiers are a common category on nouns in polysynthetic languages, including Nivkh; they are reported for instance of Nez Perce (Aoki 1970), Caddo, Zuni, Hixkaryana, of relevant Uto-Aztecan languages (cf. Mithun 1999), Tariana (Aikhenvald 1999, see (28)), Yagua (Payne & Payne 1990), Nambiquara (Lowe 1999, see (24)), Amuesha (Wise 1999, see (31)), and Tuyuca (Barnes 1990).

- (17) Yagua (Payne & Payne 1990: 452)  
 roorij-yq-dap-yóó-quii-miy  
 house-CLF:opening-CLF:patch-rotting-big-PL  
 'the several tall and rotting house doors'

In Tariana, some classifiers are identical in shape to nouns, with their lexical status (root or affix) difficult to assess (Sascha Aikhenvald, p.c.), i.e. the morphemes are in a transient stage from composition to affixation.

In Ket, a restricted range of roots, meaning for instance ‘person’, ‘female’, ‘male’, or ‘tree’ (Werner 1997: 86, 52 -54, see (53)), enters a noun complex as the second root component. Such a construction (also found in Nivkh and German) could be the source for classificatory morphemes.

(iii) *Relational derivation*

Relational derivation is frequent in complex-noun languages, but more varied in polysynthetic ones. Greenlandic, for instance, has morphemes for each of ‘owner/seller/inhabitant/fellow/cause of N’, ‘traveller to N’, ‘place/interval/container/means for N’ (see Fortescue 1990), Nez Perce has ‘possessor/inhabitant/friend of N’ and different nuances of ‘place for/of’ (Aoki 1970, see (9)), which is also the case in Chukchi (Kämpfe & Volodin 1995), and Yamphu has ‘place of many’ (Rutgers 1998: 176).

- (18) Greenlandic (Fortescue 1990)
- |    |       |                   |    |            |                     |
|----|-------|-------------------|----|------------|---------------------|
| a. | -gik  | ‘one with a good’ | c. | -lirsaarut | ‘story/account of’  |
| b. | -miuq | ‘inhabitant of’   | d. | -siut      | ‘means for seeking’ |

German and Nivkh use root concatenation.

- (19) German
- |    |                    |                          |
|----|--------------------|--------------------------|
| a. | Grönland-Reisender | ‘traveller to Greenland’ |
| b. | Einsturz.ursache   | ‘cause of collapse’      |
| c. | Naturpark-Freund   | ‘friend of nature parks’ |
| d. | Erdrutsch-Drama    | ‘landslide drama’        |

- (20) Nivkh  
*als-tam-la-f*  
 berry-a\_lot(verb)-PERM-LOCAL.NML  
 ‘place where there are a lot of berries’

(iv) *Location*

Local concepts are integrated into the noun form in Nivkh (Mattissen 2003) and Yamphu (Rutgers 1998) as a kind of “bound postposition” (relational morpheme). Relational morphemes are case-marked as nouns, but there is no double case in Nivkh.

- (21) Nivkh (Gruzdeva 1997a: 144)
- |                               |                 |              |
|-------------------------------|-----------------|--------------|
| utkuoɤla                      | tər-vəj-uin     | p’lɔv-ɖ      |
| boy                           | table-under-LOC | hide-IND/NML |
| ‘the boy hid under the table’ |                 |              |

- (22) Yamphu (Rutgers 1998: 81)  
 khim-hoŋsiʔ-yu-jhaī mæ-ʔim  
 house-inside-HORIZONTALDIRECTION-CTR.TOP NEG-sleep  
 ‘he is not sleeping inside the house’

(v) *Modals and evidentials*

These domains are rare. Epistemic modality is found on the noun in Nivkh (Mattissen 2003), Yana (Mithun 1999: 565) and Lakhta (Boas & Deloria 1979); evidential marking in Nambiquara (Lowe 1999: 282):

- (23) Yana (Mithun 1999: 565)  
 ya-ku person-perhaps ‘perhaps a person’
- (24) Nambiquara (Lowe 1999: 282)  
 wa<sup>3</sup>lin<sup>3</sup>-su<sup>3</sup>-ait<sup>3</sup>ta<sup>3</sup>li<sup>2</sup>  
 manioc-CLF:bonelike-observational.midpast.given  
 ‘the manioc root that both you and I saw some time ago’

(vi) *Quantity and possession*

Besides grammatical number, collective, distributive or sociative mark quantity on nouns, such as

- (25) Greenlandic (Fortescue 1984)  
 a. nakursa-kkut doctor-COLL ‘the doctor and the people accompanying him’  
 b. N-rpaat ‘crowd of N’  
 Yamphu (Rutgers 1998: 86)  
 c. siŋ-jira firewood-things ‘firewood and things of that sort’  
 German  
 d. Antrags.flut ‘flood of applications’ (root concatenation, *-flut* used like a derivative meaning ‘continuous and abundant flow of’)

Besides possessive markers encoding the person and number of the possessor (as in Chukchi, Greenlandic, Nivkh and Yamphu), categories such as caritive (as in Nez Perce, Aoki 1970, Chukchi, Kämpfe & Volodin 1995), partitive or alienability mark possession. Greenlandic, once again, has some interesting morphemes in this domain, non-polysynthetic German has caritive *-los*:

- (26) Greenlandic (Fortescue 1990)  
 a. -uti (alienable/temporary possession) c. -taq (meronymic relation)  
 b. -liaq ‘one’s made one’ d. -siaq ‘one’s bought/found one’

- (27) Greenlandic (Fortescue 1984: 172)
- |   |   |
|---|---|
| <p>a. niqi-uta-a<br/>meat-ALIEN-P'OR:3sg<br/>'his/her portion of meat (caught/stored etc.)'</p> | <p>b. niqa-a<br/>meat-P'OR:3sg<br/>'its meat (flesh of the body)'</p> |
|---|---|

(vii) *Scale and focus*

Morphemes expressing scalar (e.g. 'also', 'only', 'exclusively') or focus values are found in Greenlandic, Tariana (Aikhenvald 1999), Aguaruna (Payne 1990: 174), Nez Perce (Aoki 1970, see (9)), Comanche (Charney 1993), Tunica (Haas 1941), Chukchi (Kämpfe & Volodin 1995: 39), Nivkh (Mattissen 2003) and non-polysynthetic Yamphu (Rutgers 1998: 281-303), but not in German or Sanskrit.

- (28) Tariana (Aikhenvald 1999: 236)
- nu-phe-ru-ma-pe=yana-pe=tupe=miki-ite=ne=se=misini=nuku  
1s-old.sibl.-f-CLF-PL=PEJ-PL=DIMpl=PSTpl=CLF=COM=CTR=also-TOP  
'with this very person belonging to my bad little elder sisters, too'

- (29) Nivkh (Otaina 1978: 64)
- if urla-ḡ-ḡu-gir-park jeski-ḡ  
3sg good-NML-PL-INS-only sell-IND/NML  
'he sold only the good ones'

(viii) *Referential status*

Determiners and deictic elements are integrated into the noun complex for example in Chukchi (Spencer 1995, see (1)), Nez Perce (Aoki 1970: 64), Tuyuca (Barnes 1990: 281), Nambiquara (Lowe 1999) and Nivkh (see (46)), but not in Yamphu, German or Sanskrit.

- (30) Nambiquara (Lowe 1999: 287)
- Kwã<sup>3</sup>lha<sup>2</sup>-kãun<sup>3</sup>-jah<sup>1</sup>-lai<sup>2</sup>na<sup>2</sup>-sa<sup>2</sup>k?ai<sup>3</sup>lu<sup>2</sup>  
K.-young-male-this-therefore  
'this Mr. Kwalha junior'

(ix) *Clause linkage*

Subordinative and coordinative markers on nouns (irrespective of grammatical relatedness, e.g. relative and sequential markers) are marginal, anyway, only reported of Nambiquara (see example above) and Amuesha (Wise 1986).

- (31) Amuesha (Wise 1986: 626)
- koy-a-n-eša?-ña-pa?  
woman-person-CLF-SEQ-THEME  
'the woman'

Domains are not represented equally well in a single complex-noun language, there are better-equipped focal domains:

category changing morphology	prominent in Greenlandic, Chukchi
relational derivation	in Greenlandic, Nez Perce
modificational derivation	in Yagua, Tupí, German
classification	in Tariana, Nambiquara
“grammatical categories”	in Tariana, Nambiquara, Nez Perce, Chukchi, Nivkh, Yamphu.

#### 4.3. *The compositional type*

Complex nouns are classified as compositional if they are formed productively through concatenation of lexical roots, i.e. morphemes which may form free words on their own or with an inflectional affix otherwise, e.g. in the non-polysynthetic languages Sanskrit, German and (marginally) Yamphu, Nivkh and polysynthetic Chukchi, Ket, Ainu, Sora, Gorum, Onge, Tunica, Yuchi, Kiowa, Comanche, Lakhotá, Wichita, Mandan, Yagua, Urubu-Kaapor, Tupí, Mapudungun, and perhaps Pano (see Mattissen 2003).

#### 4.4. *Formal components*

##### 4.4.1. *Modifying noun or verb roots*

Both nominal and verbal roots (expressing attributes or possessors) are integrated into a noun complex, even if Nichols considers the “adjective-noun” relation to be “least prone to be head-marked” (1986: 76, 105). Productive integration of modifying verbs into their head noun is found in Chukchi, Ainu, Kiowa, Lakhotá, Tunica, Onge, Comanche, Wichita and Tupí as well as Nivkh, Sanskrit and German. In Chukchi and Nivkh, attribute and possessor obligatorily synthesize to its their head noun, except in the absolutive in Chukchi (Spencer 1995: 477, 479-480).

(32) Chukchi (Skorik 1961: 110-112)

- a. teŋ-tur-menigə-k  
good-new-cloth-LOC  
 ‘on a good new cloth’
- b. nə-teŋ-qin      nə-tur-qin      menig      (paraphrase in the ABS)  
3sgs-good-PRSII:3sg      3sgs-new-PRSII:3sg cloth(ABS.SG)  
 ‘a good new cloth’

- (33) Nivkh (Krejnovič 1934: 194)  
 ʦ'-vila-gan eʁa-ɬuz-ñi-ɬ  
 2sg.P'OR-big-dog cow-meat-eat-IND/NML  
 'your big dog ate (the) beef'
- (34) Ainu (Shibatani 1990: 73)  
 k-arka-sikihi  
 1sgs-hurt-eye  
 'my hurting eye'
- (35) Kiowa (Watkins 1984: 99-100)  
 thàli -kǰ' ní -gɔ̃  
 boy-tall-inverse.number  
 'tall boys'
- (36) Onge (Burenhult 1996: 9)  
 kɔŋ-ue-ra  
 snake-big-SING  
 'a big snake'
- (37) Lakhota (Boas & Deloria 1979: 69)  
 he' sɥ'ka-t'ə'ka?  
 that dog-big  
 'that is a large dog'
- (38) Comanche (Charney 1993: 160)  
 uʔ-ikiʔ-éka-píakwasuʔu-i nī puni-i  
 her-new-red-coat-OBJ I see-CPL  
 'I saw her new red coat'

In Wichita, two nominal roots may be concatenated, but only a small class of stative verbal roots is attached to the “combining form” of a noun they modify: ‘big’, ‘little’, ‘old’ and the colors ‘white’, ‘red’, ‘blue’, ‘yellow’, ‘black’, and ‘green’ (Rood 1976: 17-22, 138).

- (39) Wichita (Rood 1976: 5, 138, 12)  
 a. akhá-khac-iwa:c    b. né:rhirʔa-siwa:c    hasʔa:ki:-ʔi  
     house-white-big      buffalo-big                      EVID.AOR.3sg-be  
     'a big white house'      'it was a big buffalo'

In Tupí, too, stative verbs denoting colour and shape are found concatenated to nouns (Rodrigues 1999: 151).

- (40) Tupí (Jensen 1998: 512)  
wainumby-pihun  
hummingbird-black  
'black hummingbird'

In Sanskrit a noun, adjective or participle is integrated (see Whitney 1924), in German, a noun or verb root:

- (41) Vedic & Sanskrit (Whitney 1924: 495)  
a. rāja-yakṣmá-  
king-disease  
'king's disease'  
b. ajñāta-yakṣmá-  
unknown(PTCL)-disease  
'unknown disease'

- (42) German  
a. Fahr.spaß  
drive.pleasure  
'driving pleasure'  
b. 5 Geh.minuten  
5 go.minutes  
'on foot in 5 minutes'  
c. Japan-Reisender  
'traveller to Japan'

The Yamphu examples (Rutgers 1998) show the root 'other' and numeral roots in the first (pre-root) slot of a complex noun, as well as dvandva and reduplicated nouns; root concatenation and modification are not discussed in the grammar, however.

- (43) Yamphu (Rutgers 1998: 303, 312)  
a. sum-niŋ-na  
three-year-APPROXIMATIVE  
'about three years'  
b. hait-than-no?  
other-place-EXCLUSIVE\_FOCUS  
'elsewhere'

#### *4.4.2. Integration of pronouns, quantifiers and proper names*

An intriguing fact from the point of view of linguistic theory is that in Chukchi and Ainu, as well as in Nivkh, Sanskrit and German, pronouns, quantifier/numeral roots and proper names are integrated into noun complexes.

In Chukchi, pronouns, interrogatives (as in Takelma, Sapir 1922: 254) and numerals (as in Tunica and Yamphu) are incorporated into a noun complex (Spencer 1995: 479).

(44) Chukchi (Spencer 1995: 479, 477)

- a. morəg-klassə-k  
our-class-LOC  
'in our class'
- b. ga-ŋeran-wag-ma  
COM-two-claw-COM  
'with two claws'
- c. req-upicgən  
what-pole  
'what (type of) pole?'

(45) Tunica (Haas 1941: 129)

- |                              |                   |
|------------------------------|-------------------|
| ʔuhk-ʔɔ'katohk-ʔi'l-ʔunimǎn, | ʔun-ya'nak-ɔ'ni   |
| 3sg.m-child-two-dual.m       | 3dual.m-speak-QUO |
| 'he spoke to his two boys'   |                   |

The range of integrable elements corresponds to Nivkh, where also proper names (47) and complement clauses (48) are integrated.

(46) Nivkh (Panfilov 1965: 80, Krejnovič 1934: 191)

- a. hə-ŋamg-ñivx  
that-seven-person  
'those seven people'
- b. ñəŋ-gan  
1pl.excl-dog  
'our dog'
- c. siɖ-zif → k'eq-zif  
what-track fox-track  
'track of what?' 'a fox('s) track'

(47) Nivkh (Panfilov 1962: 254)

- |                            |                |                       |
|----------------------------|----------------|-----------------------|
| ʔa-dəf                     | Rajgun-dəv-ŋa? | → a-dəf               |
| which-house                | R-house-q      | that-house            |
| 'which house is Rajgun's?' |                | 'The one over there.' |

(48) Nivkh (Krejnovič 1979: 309)

- |   |                             |
|---|-----------------------------|
| [t'evrq   | pəj-ɖ]-zəu-mə-ra            |
| small_bird  | fly-IND/NML-sound-hear-HILI |
| 'I heard the sound of birds flying' (predicative form of 'fly') |                             |

Ainu allows the integration of an adverb form together with its modifying verb root.

- (49) Ainu (Shibatani 1990: 74)  
 e-pon-no-poro-setaha  
 2sg-slight-ADV-big-dog  
 ‘your slightly big dog’

In Sanskrit, a quantifier, numeral, pronoun or proper name may be integrated.

- (50) Vedic & Sanskrit (Whitney 1924: 489f, 495)
- |                  |                   |                      |
|------------------|-------------------|----------------------|
| a. sarv-ātmán-   | whole-soul        | ‘whole soul’         |
| b. eka-vīrá-     | one-man           | ‘sole hero’          |
| c. sapta-rṣí-    | seven-seer        | ‘seven sages’        |
| d. mad-viyoga-   | me:ABL-separation | ‘separation from me’ |
| e. indra-dhanús- | Indra-bow         | ‘Indra’s bow’        |

In German, even acronyms (51a) and clauses (52b) are integrated besides proper names, quantifiers, personal pronouns (51) and prepositional phrases (52a; e.g. Duden-Grammatik 2009: §1094).

- (51) German
- |                              |  |
|------------------------------|--|
| a. Ich-AG                    | ‘me-limited company/corporation’<br>(government-funded scheme for jobless people to start up their own one-man-business) |
| b. Hartz-IV-Gesetz           | (law according to suggestions by P. Hartz, phase 4)  |
| c. Michael-Jackson-Konzert   | ‘concert by M. J.’   |
| d. Dreifach-Olympia.siegerin | ‘triple-Olympic.champion’  |
| e. Viel.flieger              | much.flyer ‘frequent flier’  |
| f. Besser.verdiener          | better.earner ‘high earner’  |

- (52) German
- |                                    |  |
|------------------------------------|--|
| a. Unter.drei.jährig.en-Betreuung  | under.three.years_old.PL-care<br>‘day care for children under 3 years’                 |
| b. Hauptsache-mir-geht’s-gut-Denke | main_thing-to_me-it_goes-well-mindset<br>‘the mindset of ‘the main thing is I am okay’ |

#### 4.4.3. Inflectional categories internal to a noun complex

Even inflection can be found on a non-head within a complex in Ket, Nivkh, German and Sanskrit. A Ket noun complex may contain

up to three roots (cf. Werner 1997: 88-89), two of which may be plural marked, with wordhood of the complex evident from possessive and inflectional affixes framing the roots.

- (53) Ket (Werner 1997: 86-87)
- |                    |  |
|--------------------|--|
| a. <i>singular</i> | b. <i>plural</i>                             |
| haŋ-bɛs'           | na-haŋ-n-bɛs'-n-naŋta                        |
| 'female-hare'      | P <sup>OR</sup> .PL-female-PL-hare-PL-LOC.PL |
|                    | 'at their female hares'                      |

In German, plural marking is regularly used besides genitive at the morpheme boundary in a noun+noun compound or *ad hoc* complex.

- (54) German
- |   |
|---|
| a. AKW-Lauf.zeit.en.verlängerung        |
| nuclear.plant-run.time. PL.prolongation |
| b. Griech.en-Drama                      |
| Greek.PL-drama                          |

In Nivkh, lexical roots may be integrated into the noun complex with inflectional suffixes (number, scalar operators on nouns, aspectoid, degree, scalar operator, modality on verbs) except for case and focus, marked on the noun complex only once, signalling its right margin, and except for mood and nexus (Mattissen 2003).

- (55) Nivkh (Panfilov 1965: 87)
- pitɣə-uru-xə-la-ñivx  
book-read-HAB-PERM-person  
'bookworm'

In Sanskrit, case-marking on the non-head is "by no means rare", gender and plural markers also occur (Whitney 1924: 483-4).

- (56) Vedic & Sanskrit (Whitney 1924: 490)
- |                          |
|--------------------------|
| a. dhān-yārtha-          |
| grain(INS)-wealth        |
| 'wealth gained by grain' |
| b. mad-viyoga-           |
| me(ABL)-separation       |
| 'separation from me'     |

## 5. Internal organization

A second and independent parameter constitutes the internal organization of a complex noun form, which may be of three types.

i) A noun form offers a fixed number of slots for different elements which are fixed in their position and their order relative to each other. The maximally complex form is determined by the number of slots (although not every slot need be filled in a single form) and may be described by a template.

ii) No such template can be set up, as the components of a noun form are not fixed in their position, but in their scope, which allows them to be chained fairly freely, ordered according to the intended meaning. The noun form is not restricted in its complexity and length.

iii) A mixed organization is exhibited by word forms which have recurrent positions in a template or have templatic and scope-ordered sections, e.g. a prefixal and a suffixal domain. Due to the lack of relevant information in the grammars, the organization of complex nouns is often not easy to determine.

Among the affixal type, I did not come across “pure” scope-ordering in nouns. A template can be established for Nez Perce. Greenlandic has a mixed structure insofar as various positions in the template are recursive (indicated by exponent “n”) and because of extensive derivation of nouns, which cannot be described by a template.

(57)	MIXED	TEMPLATIC
	<i>Greenlandic</i>	<i>Nez Perce</i>
	(based on Fortescue 1984)	(Aoki 1970)
pos.	ROOT	distributive
1	alienable/meronymic	‘each’
2	modifier <sup>n</sup>	possessive prefix
3	“tense” <sup>n</sup>	modifier
4	attributivizer	ROOT
5	number:case:possessor	derivational
6		collective
7		number
8		focus, case
9		intensifier
10		caritive
11		case
12		determiner suffix
13		

(58) Greenlandic (Fortescue & Lennert Olsen 1992: 191)

ammalur-tur-ta-kasi-a  
 round-IP-meronymic-poor-P'OR:3sg  
 'its poor round part'

Among the languages with complex nouns of the compositional type, the Chukchi nominal root is modified by nominal and verbal roots which seem to be scope-ordered (cf. Spencer 1995: 480). German and Sanskrit noun complexes are scope-ordered, as well. Ket, on the other hand, has a template. Nivkh manifests a mixed structure: the pre-root domain is scope-ordered, the post-root one can be described by a template.

(59)	SCOPE-ORDERED	MIXED	TEMPLATIC
	<i>Chukchi</i>	<i>Nivkh</i>	<i>Ket</i>
	pos. (based on Spencer 1995)	(Mattissen 2003)	(Werner 1997: 88-89)
1	case (circumfix)	determiner/possessive prefix	possessive prefix
2	determiner, possessor	possessor <sup>n</sup>	ROOT 3
3	modifier <sup>n</sup>	attribute <sup>n</sup>	ROOT 2
4	ROOT <sup>n</sup> (head final)	ROOT	number of root 2
5	case:number (circumfix)	number	ROOT 1
6		“postposition”	derivative
7		case	number of root 1
8		scalar operator <sup>2</sup> / focus	case
9			derivative/verbalizer
10			number
11			converbal suffix

(60) Chukchi (Spencer 1995: 480)

ga-taŋ-tor-kətepa-nalgə-ma  
 COM-good-new-ram-skin-COM  
 'with a good, new, ram's skin'

(61) Nivkh (Krejnovič 1937: 30)

maŋki-ʧʰŋaj-vara-dəv-ŋaqr-park  
 small-picture-similar-house-one\_CLF-only  
 'only a lonesome house which looked like a small painting'

Non-polysynthetic Yamphu is a difficult case: the template given by Rutgers (1998: 9) is not borne out by the examples; focus and possessive marking are recursive, therefore a mixed structure is assumed here.

- (62) Yamphu (based on Rutgers 1998: 9; 176, 297, 154)
- a. adjective-noun/pronoun-gender/number-case/postposition-attributive\_nominalizer/plural\_nominalizer-topic&focus/info\_qualification\_suffices
  - b. Ra:jamba-dhappa-ye·m-æ?  
R.-old-ASSERTIVE-ATTRIBUTIVE\_NOMINALIZER-ERGATIVE  
'this old guy called R.'
  - c. goru-ret-ci-go  
goru-only-NON.SINGULAR-THEME  
'those two small oxen' (sic!)
  - d. Simma-æ?-yu-en-de  
Simma-POS-HORIZONTALDIRECTION-POS-INSISTIVEFOCUS  
'that [white one] from Simma'

### 6. Evolutionary types

The third parameter of evolutionary types gives us a clue as to how complex structures may have arisen. In Nez Perce, Klamath, Tariana and arguably Yamphu, we encounter different layers of morphemes within the complex form which seem to have been taken up on both sides of the root over time. The word form is not further expandable. This is termed "onion type" here.

(63)	ONION, TEMPLATIC	ONION, MIXED
	Klamath	Tariana
pos.	(based on Barker 1964: 184)	(Aikhenvald 1999)
1	distributive	possessive prefix, negative, relative
2	intensive	ROOT
3	ROOT	gender sensitive derivivative suffix
4	kinship.PL	classifier <sup>n</sup>
5	kinship.POS	plural
6	DIM/AUG	pejorative
7	time_of/in/COLL/like	approximative ('more or less')
8	derivational	diminutive
9	intensive	tense, locality (deictic)
10	INS/PARTITIVE/LOC	(agreement in classifier) <sup>n</sup>
11	case	oblique case
12		contrastive
13		coordinative ('also')
14		focus (agent/subject)
15		topic

In contrast, Greenlandic and compositional Chukchi, Tunica and Nivkh noun forms are expandable by morphemes which are

chained inside the complex, between lexical and/or inflectional morphemes which constitute a frame. This type is called “sandwich type” here.

In a third type, exhibited by Ket, Ainu, Sanskrit and German, internal residual inflection on roots (see 3.4.3) points to a coalescence of two or more word forms adjacent in origin, resulting in a synchronic single word unit. This type is called “burdock type” here (the flower-head of the burdock hooks to a host).

Again, there are no correlations to the polysynthetic or non-polysynthetic nature of the verb form, which backs the basic independence of the noun.

## 7. Conclusion

Complex noun forms are formed *ad hoc* and productively in both polysynthetic and non-polysynthetic languages. Complexity comes about either by non-root bound morphemes around a single root or by concatenation of roots, including determiners/deictics, possessors, nominal or verbal attributes, even inflected ones, interrogatives and proper names, plus non-root bound morphemes. Non-root bound morphemes comprise the focal domains of lexical-category changing derivatives, relational derivatives, modifiers, classifiers and grammatical categories. In some languages, they can be traced back to lexical roots, establishing a diachronic relation between the compositional and affixal types (cf. Mattissen 2004).

The three parameters describing nominal complexity (as well as the verbal one), viz. structural type (affixal or compositional), internal organization (scope-ordered, templatic or mixed) and evolutionary type (onion, sandwich or burdock) are independent of each other, and non-polysynthetic languages are as heterogeneous as polysynthetic ones in their structural and evolutionary types and their internal organization.

They are characterised as follows:

Sanskrit	concatenation even of challenging forms, no non-root bound morpheme
Nivkh	extensive stem concatenation, grammatical non-root bound morphemes
German	extensive noun concatenation, even of challenging forms, non-root bound morphemes
Yamphu	marginal concatenation, numerous non-root bound morphemes.

Nivkh bears a strong similarity to Chukchi, Yamphu resembles Tariana.

Interestingly, the range of challenging components (e.g. inherently focused or case marked) is paralleled by Greenlandic verbalization patterns. Being affixal in type, the language does not allow concatenation with another root, but makes extensive use of verbalization (itself independent of polysynthesis) of nouns (marginally case marked), deictics, interrogatives and proper names, e.g.,

- (64) Greenlandic (denominal verb; Fortescue 1984: 70)  
 uanga Tuumasi-u-vunga  
 1sg T.-be-IND:1sg  
 'I am Thomas'

In sum, complex nouns are head-marking in that they contain components which are constituents of a noun phrase in more analytic languages and look like “word-phrases” in that sense. They are generally independent of the type of verb forms in their respective languages, although correlations are not rare in polysynthetic languages (Mattissen 2003).

<i>Abbreviations</i>		excl	exclusive	P'OR	possessor
ABL	ablative	f	feminine	POS	possessive
ABS	absolutive	HAB	habitual	PRS	present
ADV	adverbializer	IND	indicative	PTCL	participle
ALIEN	alienable	INS	instrumental	Q	question marker
AOR	aorist	IP	intransitive		
ART	article		participle	QUO	quotative
AUG	augmentative	LOC	locative	REFL	reflexive
CLF	classifier	m	masculine	S	subject
COLL	collective	NEG	negation	SEQ	sequential
COM	comitative	NML	nominalizer	sg	singular
CPL	completive	OBJ	object	SING	singulative
CTR	contrastive	pass	passive	STAT	stative
DES	desiderative	PEJ	pejorative	TERM	terminative
DIM	diminutive	PERM	permanent	TOP	topic
EQU	equative		quality	U	undergoer
EVID	evidential	PL	plural	VBL	verbalizer

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