

# More modern typological considerations

(Sapir 1921)

- Content

I. Basic (Concrete) concepts: objects, actions, qualities.

II. Derivational concepts: less concrete & modify the content in I, e.g., farm : farmer. (lexeme-formation)

III. Concrete relational concepts: more abstract still & serves as basis for relating words to other words, e.g., animacy class, instrument class...

IV. Pure relational concepts: the most abstract (and continuation of III) & relates words to words in terms with respect to syntactic relations, e.g., this book - these books or agreement for gender class as in femme blanche v. homme blanc.

<i>Fundamental Type</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>Technique</i>	<i>Synthesis</i>	<i>Examples</i>
A (Simple Pure-relational)	—	—	a	Isolating	Analytic	Chinese; Annamite
	(d)	—	a, b	Isolating (weakly agglutinative)	Analytic	Ewe (Guinea Coast)
	(b)	—	a, b, c	Agglutinative (mildly agglutinative- fusional)	Analytic	Modern Tibetan
B (Complex Pure-relational)	b, (d)	—	a	Agglutinative- isolating	Analytic	Polynesian
	b	—	a, (b)	Agglutinative- isolating	Polysynthetic	Haida
	c	—	a	Fusional- isolating	Analytic	Cambodian
	b	—	b	Agglutinative	Synthetic	Turkish
	b, d	(b)	b	Agglutinative (symbolic tinge)	Polysynthetic	Xana (N. California)
	c, d, (b)	—	a, b	Fusional- agglutinative (symbolic tinge)	Synthetic (mildly)	Classical Tibetan
	b	—	c	Agglutinative- fusional	Synthetic (mildly polysynthetic)	Sioux
	c	—	c	Fusional	Synthetic	Salinan (S.W. California)
	d, c	(d)	d, c, a	Symbolic	Analytic	Shilluk (Upper Nile)

NOTE.—Parentheses indicate a weak development of the process in question.

<i>Fundamental Type</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>Technique</i>	<i>Synthesis</i>	<i>Examples</i>
C (Simple Mixed-relational)	(b)	b	—	Agglutinative	Synthetic	Bantu
	(c)	c, (d),	a	Fusional	Analytic (mildly synthetic)	French *
D (Complex Mixed-relational)	b, c, d	b	b	Agglutinative (symbolic tinge)	Polysynthetic	Nootka (Vancouver Island) †
	c, (d)	b	—	Fusional- agglutinative	Polysynthetic (mildly)	Chinook (lower Columbia R.)
	c, (d)	c, (d), (b)	—	Fusional	Polysynthetic	Algonkin
	c	c, d	a	Fusional	Analytic	English
	c, d	c, d	—	Fusional (symbolic tinge)	Synthetic	Latin, Greek, Sanskrit
	c, b, d	c, d	(a)	Fusional (strongly symbolic)	Synthetic	Takelma (S.W. Oregon)
	d, c	c, d	(a)	Symbolic-fusional	Synthetic	Semitic (Arabic, Hebrew)

\* Might nearly as well have come under D.  
† Very nearly complex pure-relational.

# More modern typological considerations

(following Croft 2003)

- Implication relations among values for morphosyntactic properties (Greenberg)

singular < plural < dual < trial/paucal

- Chumash (Kroeber 1904:33 cited in Croft 2003:

	Singular	Plural	Dual
1st	k-	k-i	k-i-s
2nd	p-	p-i	p-i-s
3rd	s-	s-i	s-i-s

# 3 basic models of morphology

(adapting Blevins 2007)

- Item and Arrangement (I-A): Bloomfieldian (Bloomfield 1933), Post-Bloomfieldian (Harris 1942; Hockett 1947), Generative (Lieber 1992)
- Intuition: Morphology is a sort of syntax at the sub-word level: complex words are analyzed in terms of the constituency and linear arrangement of meaningful minimal units, i.e., morphemes.
- Execution: The morphological component consists of a stock of morphemes, an inventory of morphophonemic rules that determines their surface realization, and general combinatoric rules that govern their arrangement.

# IA

(adapting Blevins 2007)

- The basic units of a morphological system are morphemes
- A morpheme is an abstract unit, a minimal form-meaning pair.
- A minimal form without a meaning is a morph (or formative).

The form -s is an allomorph, i.,e. alternative encoding, of the English {PLURAL} morpheme in the noun books and an allomorph of the {3RD SINGULAR} morpheme in the verb eats. But -s is itself a morph or marker, not a morpheme.

# IA

(adapting Blevins 2007)

- The part-whole relation in a morphological system holds between morphemes and the units composed of morphemes, i.e. complex words are simply concatenations of morphemes.
- The word has no reality or status as a theoretical object independent of its parts, i.e., **slithered** is completely as the composite of **slither** and **-d**, so theory only needs to focus on composition of the pieces and it gets the word for free.
- However, if words are irregular and unable to be decomposed into constitutive parts, i.e., they cannot be analyzed as made up of meaningful bits, then the word becomes an object that needs to be recognized, e.g., **went**.
- Words are only needed when they are irregular and that is because they do not permit systematic investigation; words are not primary objects of scientific inquiry, they are only interesting to the degree that they permit such inquiry, and if this successful, they disappear.

# IA

(adapting Blevins 2007)

- The grammar contains basic noun stems and a plural morpheme with morphologically and phonologically conditioned reflexes.
- Morphology is agglutinative, even when it might not seem so.
- The morphologically conditioned variants (**morpheme alternants**) include regular /z/, a 'zero' morph  $\emptyset$  for sheep, the 'weak' plural /n/ in oxen, and a 'replacive' morph /æ/ ~ /ɛ/ in men.

# IA

(adapting Blevins 2007)

## Stem + Morpheme

	<i>bikes</i>		<i>knives</i>		<i>men</i>	
Order	/baɪk/	{PLURAL}	/naɪf/	{PLURAL}	/mæn/	{PLURAL}
Selection	/baɪk/	/z/	/naɪv/	/z/	/mæn/	/æ/ ~ /ɛ/
Modification	[baɪk]	[s]	[naɪv]	[z]	[mɛn]	
Form	[baɪks]		[naɪvz]		[mæn]	

- Morphs are grouped into a morpheme if they ‘(a) have the same meaning, (b) never occur in identical environments’ (Harris 1942:115).
- Modification is expressed by morphophonemic rules that map a morphophoneme /z/ onto allomorphs such as [z], [s] and [əz]. Some accounts introduce a zero morph which triggers item-specific ablaut.



# IA

(adapting Blevins 2007)

**Pros:** Parsimonious in that it permits parallels with units and combinatoric principles at other linguistic levels:

- Words are built up of morphemes like morphemes are built up of phonological units such as the phoneme.
- Linear and constituent structure arrangements of morphemes parallel the linear and constituent structure arrangements of words into phrases and phrases into clauses.

**Cons:** Problems of selection and interpretation, which lead to

- The selection of a plural allomorph is not always determined by the properties or the form of a stem entry: man~men vs van~vans.
- It is frequently difficult to assign independent meanings to segments.
- It is highly artificial to treat all form variation in terms of 'items' and to assume that all morphology is agglutinative.

Itelman (Chukatko-Kamchatkan) – Kamchatka peninsula in Russia

Subject (singular)			
Object	1	2	3
Sg. 1		əntxla <del>x</del> kmiŋ	əntxla <del>x</del> kommen
2	təntxla <del>x</del> kin		əntxla <del>x</del> kin
3	təntxla <del>x</del> kicen	əntxla <del>c</del> gin	əntxla <del>c</del> iŋnen
Pl. 1		əntxla <del>x</del> kmiʔŋ	əntxla <del>x</del> konnaeʔŋ
2	təntxla <del>x</del> kisxen		əntxla <del>x</del> kisxen
3	təntxla <del>x</del> kiceʔŋ	əntxla <del>c</del> giʔŋ	əntxla <del>c</del> iŋneʔŋ
Subject (plural)			
Sg. 1		əntxla <del>x</del> kmiŋsx	nəntxla <del>x</del> kommen
2	nəntxla <del>x</del> kin		nəntxla <del>x</del> kin
3	nəntxla <del>x</del> kicen	əntxla <del>s</del> xik	nəntxla <del>x</del> lagenen
Pl. 1		əntxla <del>x</del> kmiʔŋsx	nəntxla <del>x</del> komneʔŋ
2	nəntxla <del>x</del> kisxen		nəntxla <del>x</del> kisxen
3	nəntxla <del>x</del> kiceʔŋ	əntxla <del>x</del> kiʔŋ	nəntxla <del>x</del> lageneʔŋ

Hypothesis: stem - əntxla

SUBJ: 1sg	t -	2sg/1sg	-xkmiŋ	3sg/1sg	-xkomen
1pl	n -	2sg/1pl	-xkmiʔŋ	3sg/2sg	-xkin
				3sg/3sg	-ciŋnen
OBJ: 2sg	-xkin	2sg/3sg	-cgin	3sg/1pl	-xkonnaeʔŋ
2pl	-xkisxen	2sg/3pl	-cgiʔŋ	3sg/2pl	-xkisxen
3sg	-xkicen			3sg/3pl	-ciŋneʔŋ
3pl	-xkiceʔŋ	2pl/1 <sup>st</sup> = 2sg/1 <sup>st</sup> + sx			
		2pl/3sg	-xkik	3pl SUBJ	n- + sg SUBJ form except for 3sg OBJ;
		2pl/3sg	-xkiʔk	3pl OBJ form = 3sg + ʔ	in 1pl & 3pl and xkisxen- for 2pl
pl OBJ -ʔ- (3 <sup>rd</sup> );	1pl & 3pl OBJ -ʔ-;	1pl SUBJ	-sx	1pl & 3pl OBJ -ʔ-;	paradigmatic gap in the contrast between SUBJsg. (ø)
SUBJ contrast sg (t-) & pl (n-)	(same as -sx- in e.g 2pl -xkisxen?);	no SUBJ prefixes		SUBJ pl (n-)	

cg v. xk; n- cannot 'mean' 1 pl SUBJ, since it is also used for 3 pl SUBJ, n = non-2<sup>nd</sup> pl.

# 3 basic models

(adapting Blevins 2007)

- **Item and Process (IP):** Boas (1947); Sapir (1921); Hockett (1954); Steele (1995).
- **Intuition:** Morphological alternations involve general ‘processes’ that apply to a lexical base, and which add, remove or alter properties at the same time that they modify the form of the base. Some processes may introduce a discrete affixal ‘item’, but others may subtract or reorder segments, or change or alter segmental or suprasegmental characteristics of a base.
- **Execution:** The grammar consists of an inventory of root or stem entries and an inventory of morphological rules that map entries onto new ‘derived’ property/form pairs. Unlike in IA, affixes are not represented as entries placed in positions by independent rules, but the affixes are simply one type of rule among many for morphological exponence.

# IP

(adapting Blevins 2007)

- A morphemic model that distinguishes two types of morphemes:
  - lexical morphemes, represented by stem entries (‘items’),
  - grammatical morphemes, represented by ‘processes’ represented as rules.
- The LEXEMES of a language are associated with entries of the form  $\langle \mu, \varphi \rangle$  where  $\mu$  designates the meaning of the LEXEME and a morphosyntactic property set and  $\varphi$  is a stem form.
- A rule applies to  $\langle \mu, \varphi \rangle$ ; rules have two aspects
  1. a function  $\kappa$  applies to  $\mu$  to create a new feature set  $\kappa(\mu)$
  2. a function  $\pi$  applies to  $\varphi$  to create a new form  $\pi(\varphi)$
- The basic effect is to take as input  $\langle \mu, \varphi \rangle$  and to alter both  $\mu, \varphi$ , having a single effect on  $\mu$  and possibly multiple effects on  $\varphi$ .

# IP

(adapting Blevins 2007)

- A rule, like a morpheme, has a constant meaning and a variable form.
  - The PLURAL rule always adds [PLUR] to M, with different operations to affect, depending on the class of a noun.

	Properties	Form	Properties	Form	Properties	Form
Input	[N]	/baik/	[N]	/naif/	[N]	/mæn/
Change	add PLU	$X + /z/$	add PLU	$\text{voi}(X) + /z/$	add PLU	$\text{abl}(X)$
Effect	[N, PLU]	/baikz/	[N, PLU]	/naivz/	[N, PLU]	/mæn/
Output	[N, PLU]	[baiks]	[N, PLU]	[naivz]	[N, PLU]	[mæn]

# IP

(adapting Blevins 2007)

**Pros:** Avoids interpreting all alterations in form as underlyingly affix type 'items'.

- Ablaut, voicing, subtraction, etc., can be treated as processes (effected by rules) so that morphology is not reduced to viewing complex wordforms as linear and hierarchical arrangements of morphemes.
- Those forms which do not exhibit change need not be interpreted as possessing 'zero' morphs, e.g., a **run**, where the derivation  $V \Rightarrow N$  in IA is assumed to have  $\text{run}-\emptyset_{\text{noun}}$

**Con:** Addresses only some challenges that confront morphemic analysis:

- While multiple zero morphs, i.e., ' $\emptyset$ ' are no longer required, it is still necessary to apply a rule to derive plural forms like **sheep**, even though there no form difference between singular and plural.
- Meanings are always associated with 'aspects' of form, even though modification of form is interpreted more generously than in IA.

# IA & IP

- Syntagmatic: it emphasizes the linear (and hierarchical) coordination of constitutive elements.
- Compositional: it endeavors to derive or associate the meaning of the whole word from the meanings of its isolable subparts.
- Vertical: it is derivational, positing an underlying or surface structure form from which a target structure can be asymmetrically derived. i.e., focus on describing all forms exhibiting the same morphosyntactic properties (plural nouns above), but not on paradigms of whole words. That is, it focuses on deriving the forms for each cell in the paradigm, but not on any pattern represented by all the words of a paradigm.
- Both words and paradigms are epiphenomena, not primary objects of morphological inquiry.

# Word and Paradigm

Traditional WP models are exemplar-based

- The forms of an inflectional system are organized into paradigms.
- Each paradigm contains one or more diagnostic or 'leading' form.
- New items are inflected by analogy to an established paradigm.
- For pedagogical exposition, a system can be factored into two components:
  - A set of exemplary paradigms that exhibit distinctive patterns.
  - A stock of principal parts for any non-exemplary item.



# Word and Paradigm

- Exemplar-based systems based on analogy; distillation of abstract patterns based on many exemplars.
- Paradigmatic: identifies (sets of) patterns that whole words participate in, i.e., the contrast sets that wholes participate in.
- Configurative: while the meaning of a wordform is not necessarily construed as a straightforward composition of individually meaningful parts, the meaning of the whole is associated with reliable arrangements of its constitutive elements, i.e. it is the arrangement of cooccurring proper-ties of words that are associated with the whole word meaning, rather than the meaning being derived from its constituent parts.
- Horizontal: relations among networks of inflected surface forms which share a lexeme as well as the schematic patterns of implications abstracted from them on the basis of analogy.

# Internal organization: words as recombinant gestalts

- Surface words, expressed synthetically (single morphologically integrated wordform) or periphrastically (multiple word forms as in Somali & Dhaasanac below), are construed as recombinant gestalts, i. e., ensembles/patterns of recurrent elements where it is not necessarily the smaller pieces that are meaningful, but rather the specific configurations of elements that are associated with meaning.

“...we cannot but conclude that linguistic form may and should be studied as types of patterning, apart from the associated functions.” Sapir 1921:60

“This feeling for form as such, freely expanding along predetermined lines and greatly inhibited in certain directions by the lack of controlling types of patterning, should be more clearly understood than it seems to be. A general survey of many diverse types of languages is needed to give us the proper perspective on this point.” Sapir 1921:61

# Internal organization: words as recombinant gestalts

Somali General Past (7 clitics, 5 forms)		Dhaasanac Past (4 clitics, 2 forms)	
1SG	aan <b>furay</b>	<sup>h</sup> á <b>furi</b>	A-form
2SG	aad <b>furtay</b>	<sup>h</sup> á <b>fudʔi</b>	B-form
3SG. M	uu furay	<sup>h</sup> á <sup>h</sup> ì furi	A-form
3SG. F	ay furtay	<sup>h</sup> á <sup>h</sup> ì fudʔi	B-form
1PL	Incl. aannu <b>furnay</b>	Incl: <sup>h</sup> á hé furi	A-form
	Excl. aynu <b>furnay</b>	Excl: <sup>h</sup> á ñì fudʔi	B-form
2PL	aydin <b>furteen</b>	<sup>h</sup> á <sup>h</sup> ì fudʔi	B-form
3PL.	ay <b>fureen</b>	3PL.M <sup>h</sup> á <sup>h</sup> ì furi	A-form
		3PL.F <sup>h</sup> á <sup>h</sup> ì fudʔi	B-form

# External organization: words as participants in networks of relations

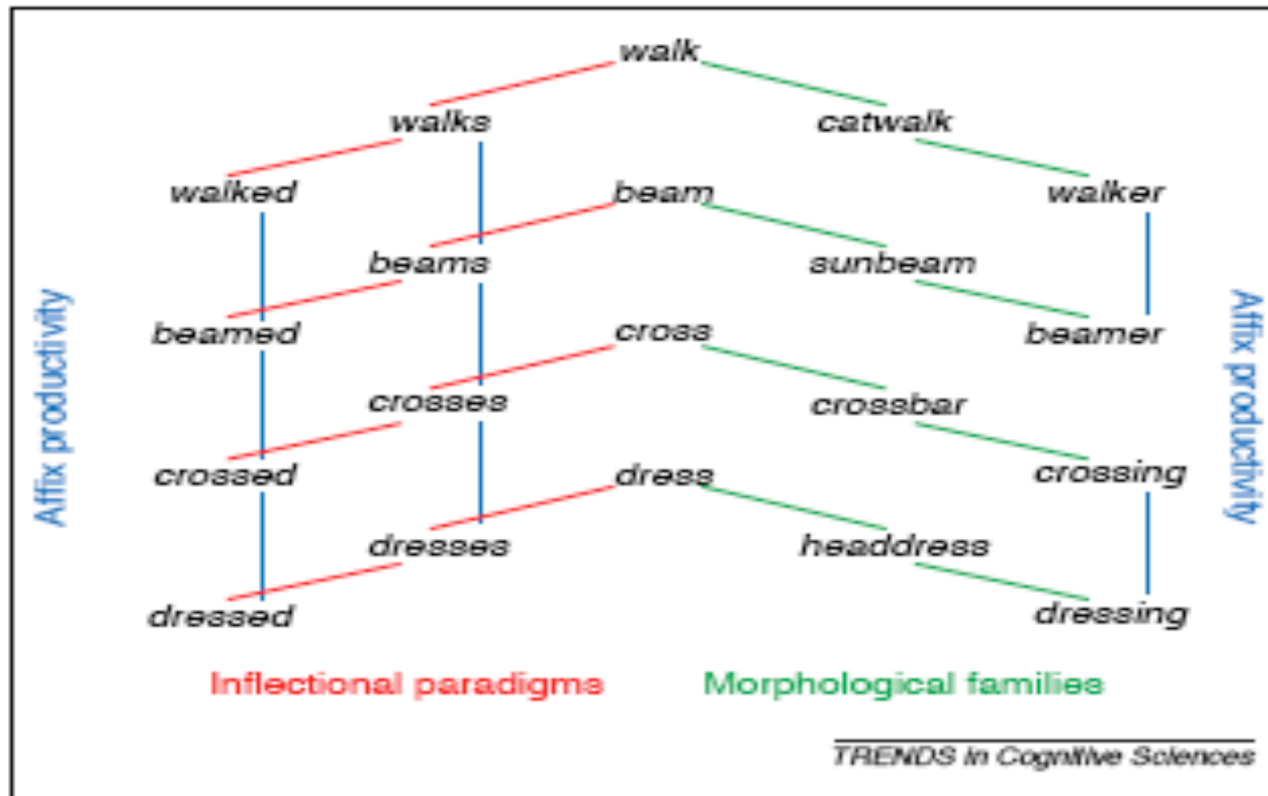


Figure 1. Examples of paradigmatic lexical relations in English. Relations between inflected variants (inflectional paradigms) are shown in red, relations between morphologically related compounds and derived words (morphological families) are shown in green, and relations between words sharing the same affix are shown in blue. Affixes that occur across many words are described as productive.

# WP

- Existing forms provide a base for deductions using proportional analogy:

$A : B = C : X$ , where  $A : B$  refers to an established pattern,  $C$  is a word, and  $X$  is the unknown word that must be ‘solved for’.

To deduce an English plural form,  $A : B$  would represent one singular-plural pattern,  $C$  a singular form, and  $X$  the unknown plural form.

- Analogical patterns  $A : B$  vary in terms of frequency and specificity:

The regular pattern ‘ $X : Xz$ ’ is the most frequent pattern in English, but also the least specific, since there are no constraints on  $X$ .

The voicing pattern ‘ $Xf : Xvz$ ’ is relatively infrequent, but also highly specific, since it only applies to nouns whose singular ends in -f.

There is no analogical model for man-men, since  $\boxed{m}$   $\boxed{m}$  is the only

lexeme in English that exhibits this alternation, and the other ‘strong’

# WP

- Analogical patterns A : B vary in terms of frequency and specificity:

The regular pattern 'X : Xz' is the most frequent pattern in English, but also the least specific, since there are no constraints on X.

The voicing pattern 'Xf : Xvz' is relatively infrequent, but also highly specific, since it only applies to nouns whose singular ends in -f.

There is no analogical model for **man~men**, since MAN is the only lexeme in English that exhibits this alternation, and the other 'strong' plural forms are similarly isolated: **foot~feet**, **mouse~mice**, etc.

# WP

- Hence a traditional WP analysis leads to the following expectations:

Because of the high frequency of the pattern 'X : Xz', the proportional analogy  $X : Xz = Y : Yz$  will identify the plural form of most nouns, including nearly all new nouns, and will tend to 'attract' nouns that historically showed different patterns of plural formation.

Because of the high specificity of the pattern 'Xf : Xvz', the proportion  $Xf : Xvz = Yf : Yvz$  will identify the plural forms of existing nouns that end in -f and will occasionally recruit new members. The conflict between frequency and specificity will sometimes lead to variability or indeterminacy, as in roof~roofs vs roof~rooves.

In the absence of enough supporting examples, both members of the pairs man~men, foot~feet, mouse~mice, etc., must simply be learned.

# WP

**Pro:** Offers a surface-based, 'scalable' analysis of inflectional systems.

- Analogical deduction is well established in other cognitive domains.
- Analogies operate over perceptible properties of surface forms, rather over more abstract underlying representations or properties.
- Sensitivity to the frequency of inflected word forms suggests that 'high frequency' forms, regular or irregular, are tracked and stored as wholes.
- WP models offer descriptions of languages of arbitrary complexity, because exemplary patterns can apply at different levels of specificity.

**Con:** It becomes less clear what the fundamental organization of morphology looks like.

- There is a vast space of potential analogical patterns: are there constraints on the limits of these patterns?
- WP models may fail to give a revealing analysis of the organization of agglutinative systems that lack paradigms and inflection classes.